VOL. 1. PART 1.

JOURNAL

OF THE

SOCIETY FOR BRITISH ENTOMOLOGY

(Formerly known as The Entomological Society of the South of England)

EDITOR:

F. J. KILLINGTON, B.Sc., A.L.S., F.R.E.S.

ASSISTANT EDITOR:

B. M. HOBBY, M.A., D.PHIL., F.R.E.S.

DATE OF PUBLICATION: 10th MAY, 1934.

Copies may be purchased from the Secretary at 102 High Street, Southampton.

Price 2s. 6d., post free.

CONTENTS.

PAGE

AUDCENT, H. : *Lipsothrix nobilis* Lw., a Tipulid (Dipt.) new to Britain 7

BOYD, D. O. : Unusual behaviour of *Bombus agrorum* F. (Hym.) 9

COLLIN, J. E., J.P., F.R.E.S., and WAINWRIGHT, C. J., F.R.E.S. : Some Diptera collected in the South of England in 1930-33 17

DIXON, C. H. : *Synia musculosa* Hübn. (Lep.) in Hants ... 9

GOFFE, E. R. : *Tubifera* (=*Eristalis*) *tenax* Linn. (Dipt., Syrph.) in flight in December 10

———— Diptera taken in Scotland in 1933 11

HAMM, A. H., A.L.S., F.R.E.S. : Syrphidae (Dipt.) associated with flowers 8

———— Insects at Honey-dew 9

HARWOOD, P., F.R.E.S. : Coleoptera taken in Scotland in May and June, 1933 4

HOBBY, B. M., M.A., D.Phil., F.R.E.S. : Further records of the food of Cantharidae (Col.) 10

JOHNSON, C. G., B.Sc. : Note on the oviposition of *Notostira erratica* L. (Hem., Capsidae) 7

KILLINGTON, F. J., B.Sc., A.L.S., F.R.E.S. : Hymenopterous parasites bred from Hemerobiidae (Neur.) in 1933 6

RICHARDS, O. W., M.A., F.R.E.S. : Some breeding records of Hymenoptera 1

———— Some breeding records of Diptera 2

———— The oviposition of *Malachius bipustulatus* Ol. (Col., Melyridae) 3

STOWELL, E. A. C., B.A. : A note on Lepidoptera in the Isle of Wight 3

Communications for publication in this *Journal* should be sent to the Editor at 22 Litchfield Road, Bitterne Park, Southampton.

QL
482
G7J86
ENT

JOURNAL OF THE SOCIETY FOR BRITISH ENTOMOLOGY

VOL. 1. 10th MAY, 1934 PART 1

Some breeding records of Hymenoptera.

CHALCIDIDAE.

Trigonoderus ductilis Walk. (Cleonyminae).

Numerous specimens of this Chalcidid (kindly determined by Dr. C. Ferrière) were bred out from old gorse stems collected on St. Martin's, Isles of Scilly, 21st April, 1930. The parasites emerged between 23rd and 28th May, 1930, together with many specimens of the beetle, *Anobium domesticum* Fourc., which was almost certainly the host.

PROCTOTRUPIDAE.

Spilomicrus basaliformis Westw. (Belytinae).

A male of this insect (kindly determined by Mr. G. E. J. Nixon) was found inside a beetle pupa when the latter was broken open. The pupa was found under heather at Commwood, Herts, 27th March, 1927, and was identified by Dr. K. G. Blair as belonging to one of the genera *Quedius* or *Philonthus* (Staphylinidae).

BRACONIDAE.

Liposcia discolor Marsh. (Dacnusiinae).

Three males (det. Mr. G. E. J. Nixon) were bred from Dipterous mines in primrose leaves, Bagley Wood, Berks, 31st October, 1926. The host was almost certainly *Phytomyza primulae* R.-D.

Dacnusa abdita Hal. (Dacnusiinae).

Two females, one male (det. Mr. G. E. J. Nixon), were bred from a blotch of *Agromyza reptans* Fall., in leaf on nettle, Bagley Wood, Berks, 30th June, 1927; one male emerged August, 1927; females emerged September, 1927.

Dacnusa misella Marsh. (Dacnusiinae).

A male and female of this species (det. Mr. G. E. J. Nixon) were bred from blotches in the leaves of *Euphorbia amygdaloides* L., Open Brasenose Wood, Oxford, 24th October, 1926. The host was almost certainly *Liriomyza pusilla* Mg.

Alloea contracta Hal. (Alysiinae).

Three females were bred from larva of *Lonchoptera* collected at Washford, near Kirtlington, Oxon, 9th December, 1924. The commonest species of *Lonchoptera* in the locality was *L. lutea* Pz., which was probably the host species. Lundbeck (1916, *Diptera Danica*, **5**: 5) records the same host.

SMITHSONIAN
NOV 1 6 1934

Exothecus braconius Hal. (Exothecinae).

This is a common parasite of leaf miners, stated to attack both Lepidoptera and Diptera. I have bred it from the following flies :—Three females from *Dizygomyza verbasci* Bouché, mine in *Verbascum* sp., in garden, Iver, Bucks, emerged 11th August, 1930; female from blotches in the leaves of *Aquilegia* (probably *Phytomyza aconiti** Hendel), in garden, Iver, Bucks, emerged 11th August, 1930; female from *Liriomyza amoena* Mg., in elder, Slough, Bucks, 26th August, 1933, emerged 5th September, 1933; three females from mines of *Phytomyza ranunculi* Schrank var. *flava* Fall. in *Ranunculus repens* L., Bagley Wood, Berks, 11th June, 1927, emerged 4th July, 1927; male from *Phytomyza* sp., mine in leaves of *Symphoricarpus,* Wavenden, Beds, 27th June, 1925. O. W. Richards.

Some breeding records of Diptera.

I.

Chloromyia formosa Scop. (Stratiomyidae). Two larvae attacking roots of *Aconitum napellus* L. already damaged by millipedes (Slough, Bucks, 21st November, 1932), produced on 9th March and 17th March, 1933, two males of the above fly.

Microdon eggeri Mik (Syrphidae). A number of puparia of this species were found under pine bark in a nest of the ant *Acanthomyops niger* L., at Ascot, Berks, 26th March, 1933. Two females emerged on 21st April, 1933, but the other puparia dried up.

Clusiodes gentilis Collin (Clusiidae). A puparium of this species found in a rotten birch log at Oxshott, Surrey, 3rd May, 1928, produced a female on 22nd May, 1928. Four puparia found in a rotten birch trunk at Eridge Park, Kent, 15th April, 1933, produced two males and two females between 27th April and 1st May, 1933.

Clusiodes albimana Mg. (Clusiidae). Three puparia found in a rotten birch trunk at Eridge Park, Kent, 15th April, 1933, produced one female and two males between 22nd and 29th April, 1933.

II.

The inhabitants of a decayed Beech tree.

A quantity of decayed, fungus-impregnated wood was taken from the trunk of a partly decayed beech tree at Virginia Water, Surrey, 8th March, 1933. The following insects were bred out:—

* The normal Phytomyzids attacking *Aquilegia* are *P. aquilegiae* Hardy and *P. minuscula* Goureau; in the Iver locality, however, flies bred from blotches in Columbine leaves seem to be identical with *P. aconiti* Hend., which normally attacks *Aconitum* and *Delphinium.*

Phaonia scutellaris Fall. (Anthomyiidae), male and female, April, 1933.

Copromyza suillorum Hal. (Copromyzidae, Borboridae), one male, 28th March, 1933.

Drapetis assimilis Fall. (Empididae), one female, 2nd May, 1933.

Xylomyia (*Solva*) *maculata* Mg. (Xylophagidae), one female, 6th May, 1933.

Ctenophora pectinicornis L. (Tipulidae), one male, 3rd April; one male, 7th April; one female, 10th April; one male, 12th April; one female, 21st April, 1933.

Ectaetia platyscelis Lw. (Scatopsidae), one male, 7th April, 1933.

Scatopse new species, subgenus *Holoplagia* (Scatopsidae), one male, 7th April; one female, 12th April; one female, 24th April, 1933. Dr. F. W. Edwards proposes to describe this species.

Culicoides obsoletus Mg. (Ceratopogonidae), one male, 29th March; two males, 31st March, 1933.

Dasyhelea, probably new species (Ceratopogonidae), one male, 2nd May, 1933. A beetle, *Abraeus globosus* Hf. (Histeridae) also emerged on 2nd May, 1933.

III.

Tipula flavolineata Mg. (Tipulidae). A large number of larvae were found in a birch stump at Burnham Beeches, Bucks, 9th April, 1933, together with the beetle *Sinodendron cylindricum* L. The following adults of the fly emerged in May, 1933: — male, 6th; female, 9th; male, 10th; male, 15th; male and female, 20th.

O. W. Richards.

The oviposition of Malachius bipustulatus Ol. (Col., Melyridae).

Two females of this beetle were seen at Hedgerley, Bucks, 28th May, 1933, to insert their ovipositors into deep cracks in the *living* bark of a large oak tree. The larva is known to be predacious and is usually found under *dead* bark. A male pupa found at Shamley Green, Surrey, 1st May, 1932, under dead oak bark, produced the adult on 9th May, 1932.

O. W. Richards.

A note on Lepidoptera in the Isle of Wight.

(1) The following species not hitherto recorded from the Island have been taken within half a mile of my home at Alverstone:—

Drymonia trimacula Esp. (=*dodonaea* Hübn.), three at light in garden.

Hylophila bicolorana Fuessl., a few larvae, two or three bred.
Apamea ophiogramma Esp., probably common.
Collix sparsata Hübn., very local.

(2) I have taken the following, not in Mr. Fassnidge's list (1923-25, *Ent. Rec.*, **35-37**, Suppl., 1-42), but they were reported to the I.W. Nat. Hist. Society by other collectors before me:—

Cochlidion limacodes Hufn., female.
Euchoeca obliterata Hufn., surely an oversight: common among alder.
Eupithecia linariata F., bred freely where food plant occurs.
Eupithecia valerianata Hübn., larvae abundant, 1930, scarce since then.
Ennomos erosaria Borkh., abundant at village lamps, 1931.

(3) The following in Mr. Fassnidge's list are marked 'old records only':—

Polyploca ridens F., larvae sometimes common.
Drepana lacertinaria L., not common.
Lithophane semibrunnea Hw., single specimens at sugar annually in my garden.
Plusia pulchrina Haw., one specimen in garden.
Hybernia aurantiaria Esp., surely overlooked.
Perinephela lancealis Schiff., in two localities here.
Myelois cribrella Hübn., common.

(4) The following have not often been taken in the Isle of Wight:—

Spilosoma urticae Esp., two specimens in garden.
Plusia festucae L., two in garden and one bred.

(5) Tortrices. I have not done very much with these. The following are not reported from the Isle of Wight in Mr. Fassnidge's list (1929, *Trans. Ent. Soc. S. Eng.*, **5**: 41-60):—

Phalonia cnicana Doubl., two specimens ('old record—I.W.G.').
Phalonia alismana Rag., one larva.
Phthaeschroa maculosana Haw., common among wild hyacinth.
Eucosma sinuana Hübn., a few at light.
Acroclita naevana Hübn.

E. A. C. Stowell.

Coleoptera taken in Scotland in May and June, 1933.

My wife and I left Bournemouth on the 24th May and reached Kinloch Rannoch in mid-Perth about mid-day on the 26th and stayed there until the 29th, when we moved on to Granish, near Aviemore.

Soon after our arrival at Rannoch I was fortunate in finding a specimen of the very rare Serricorn, *Athous undulatus* De G., and further search the next day yielded two pupae which duly emerged. Little else of interest was found there except a single example of *Elater pomorum* Hb., which is recorded as far north as Strathpeffer and as far south as Chippenham Fen in Cambridgeshire, but according to my experience is decidedly rare.

On resuming our journey a detour was made at Dalwhinnie via Laggan Bridge, and the route followed was along the right bank of the Spey, rejoining the main road at Newtonmore. A climb of one of the lesser hills near the last-named township produced very little except a short series of *Atheta curtipennis* Sharp.

The first morning at Aviemore was spent up the valley of the small burn from which our water supply is derived, and from a blown fir tree which had been sawn through several of the Longicorn, *Acanthocinus aedilis* L., were obtained. A fine variety of the common *Rhagium bifasciatum* F. was also obtained from the same log, besides a series of the beetle, *Pityogenes quadridens* Hartig.

The weather during this period was ideal, and most insects seemed to be quite a fortnight in advance of their usual time of emergence, *e.g.* the rare Longicorn, *Leptura* (*Pachyta*) *sexmaculata* L., was found on 3rd June, and during the following fortnight I completed my series by attracting them to the flowers of *Heracleum* and Mountain Ash. *Leptura sanguinolenta* L. turned up on the 12th, nearly three weeks earlier than I had previously observed the species, but as I have never been able to collect in the district between the 24th June and 4th July, except in 1913, these data may not be of much value.

At Granish, when pulling up some very thick and long moss at the foot of a stunted birch, I noticed that the ground was honeycombed with the 'runs' of some small animal, presumably a mouse or shrew, as a nest was found among the moss; these 'runs' were perfectly well defined and quite clean, but there were two or three openings which were obviously used as 'latrines,' as there were comparatively large deposits of excreta in these places. In these 'latrines' were found two or three specimens of the genus *Catops* (Clavicornia) and several of the rare Staphylinid *Atheta valida* Kraatz.

A few specimens of the Rose Chafer, *Cetonia floricola* Herbst., were obtained at sugar traps, and several *Carabus glabratus* Payk. in the same way, together with several species of *Atheta* and *Epurea* and a few of the Clavicorn, *Glischrochilus* (*Ips*) *quadripustulatus* L.

Many beetles were taken on the wing in the valley, including *Tachinus elongatus* Gyll., *Antherophagus pallens* F., etc., and the Serricorn, *Corymbites cupreus* F. var. *aeruginosus* F., was

flying in great numbers among the grass, but only two or three of the type form were noticed. On the other hand, on the high cliffs near Duncansby Head, on the 5th June, the type form of *C. cupreus* was seen flying in numbers, but only a single specimen of the variety was observed; the solitary wasp, *Odynerus pictus* Curt., was also seen here (several nests of this wasp were found in 1932 on the lichen-covered boulders just above high-water mark).

During our return southwards we noted the following species in Gruinard Bay: *Bembidium pallidipenne* Ill., *Bledius arenarius* Payk. var. *subniger* Schneid., *Aegialia arenaria* F., *Aphodius sordidus* F. and a few other common species. We stayed at Loch Maree for the night of the 8th June, and during the evening found a few *Bembidium virens* Gyll. under stones on the loch side; it is strange that this beetle has so far not been found in any other locality in the British Isles.

On the 10th June I visited Boat of Garton and spent the morning turning stones. This is one of the very few known localities for *Ocypus cyaneus* Payk., but I have consistently found it there every year since I first discovered it in 1925.

P. Harwood.

Hymenopterous parasites bred from Hemerobiidae (Neur.) in 1933.

1. From *Hemerobius stigma* Steph.—A parasitised larva of this species was taken from Scots Pine on the 6th July, 1932, at Beaulieu Road, Hants. On the 11th May, 1933, a single example of the Cynipid, *Anacharis ensifera* Walk., emerged from the host cocoon. Withycombe (1923, *Trans. Ent. Soc. Lond.*, **1922**: 591) has recorded the same parasite from *H. stigma*.

2. From *Wesmaelius quadrifasciatus* Reut.—In May, 1932, *Hemiteles* (Ichn.) females were noted ovipositing in cocoons of this lacewing on larches in Tubney Wood, Berks. About two hundred cocoons were collected and subsequently examined, and a number were found to contain a white ectoparasitic larva feeding on the resting prepupa within. Two adult parasites emerged on the 2nd July, 1932, and were found to be females of *Hemiteles rubripes* Thoms., a species new to Britain (Killington, 1933, *Trans. Ent. Soc. S. Eng.*, **8** (2): 89). Other parasitic larvae, which were thought at the time to be of the same species, spun elongate white cocoons within the host cocoons in June, 1932, and then overwintered, the imagines (five females and two males) not emerging until April and May, 1933. These prove to be a new species, and Dr. A. Roman has kindly described them under the name *Hemiteles wesmaeliicida* (1934, *Stylops*, **3** (2): 34). The type has been placed in the British

Museum and cotypes will be presented to the Hope Department, University Museum, Oxford. FREDK. J. KILLINGTON.

Lipsothrix nobilis Lw., a Tipulid (Dipt.) new to Britain.

On the 16th June, 1929, at Matley Bog, New Forest, Hants, I caught a species of *Lipsothrix* which has now been determined by Dr. F. W. Edwards as *L. nobilis* Lw. It is an addition to the British fauna and the specimen has been presented to the British Museum. H. AUDCENT.

Note on the oviposition of Notostira erratica L. (Hem., Capsidae).

The over-wintered form (female 4) of *Notostira erratica* L. is known to oviposit between the sheathing leaf-bases and the culms of certain grasses (China, 1925; Johnson, 1932) during the spring and early summer. The summer form (female 1) in 1933 was observed to oviposit in the flowers of *Agropyrum repens* Beauv. (Gramineae), upon whose leaves both adults and larvae were feeding actively.

The behaviour of the insects when laying eggs was essentially similar to that previously described by the author (*vide supra*). Greater difficulty was experienced when ovipositing in the flowers than when the act was performed within the leaf-sheaf, and the process was characterised by great persistence; in some instances as long as half an hour elapsed before the ovipositor was successfully lodged. The insect rarely inserted the ovipositor in the same place that it finally tapped with its proboscis, and during the blind groping with the ovipositor for the slit between the pales of the flower most ungainly postures were frequently assumed, and the ovipositor was often in most unfavourable positions for insertion.

Fig. 1.—SPIKELET.
a = Flowerless Glumes.
b = Inner pale of flowers.
c = Stamen.

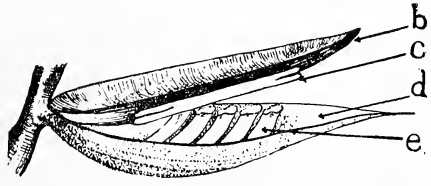


Fig. 2.—SINGLE FLOWER.
d = Outer pale of flower.
e = Eggs.

The eggs were invariably found along the inner face of the outer pale of the flower (*d*), where between two and eight eggs

were placed with their caps facing towards the outer margin of the pale. Several flowers in the same spike, not always in the same spikelet, often contained eggs, but any flower in a spikelet was used. In spite of many observations, eggs were found neither in the outer flowerless glumes (*a*) nor in the inner pales of the flowers (*b*). In nature, no eggs of female 1 were found within the leaf-sheathes, although the insects would oviposit there if placed upon them.

REFERENCES.

China, W. E. 1925. Notes on the Life History and Habits of *Notostira* (*Megaloceraea*) *erratica* L. *Ent. Mon. Mag.*, **65**: 28–33.

Johnson, C. G. 1932. The Oviposition and Ovipositor of *Notostira erratica* L. (Hemiptera). *Trans. Ent. Soc. S. Engl.*, **8** (1): 50–57.

C. G. Johnson.

Syrphidae (Dipt.) associated with flowers.

In two visits to Cothill, Berks, during 1933 ten different species of the genus *Chilosia* were observed at the flowers of *Caltha palustris* L. A detailed list of these, together with a few other records of Syrphid visitors to flowers, is given below.

CALTHA PALUSTRIS L. — *Chilosia chrysocoma* Mg., one female; *C. antiqua* Mg. (= *sparsa* Lw.), one specimen; *C. pulchripes* Lw., a good variable series including a few of the form *floccosa* Verr.; *C. honesta* Rond., two only; *C. albitarsis* Mg., abundant; *C. fraterna* Mg., two only; *C. bergenstammi* Beck., a long series; *C. praecox* Zett., two only; *C. vernalis* Fall., five specimens; *C. proxima* Zett., one specimen; *Pipizella virens* F.; *P. heringi* Zett.; *Pipiza noctiluca* L., one female; *Platychirus discimanus* Lw., a few; *Eristalis intricarius* L., one female; *Ascia dispar* Mg., fairly abundant. All taken on May 6th and 9th, 1933, in a very small area at Cothill, Berks.

SCILLA NONSCRIPTA Hoffm. & Link.—*Leucozona lucorum* L., abundant; *Rhingia campestris* Mg., abundant; *Syrphus bifasciatus* F., occasional.* All noted on 9th May, 1933, at Cothill.

ANTHRISCUS SYLVESTRIS Hoffm. — *Chilosia honesta* Rond., locally plentiful at the end of May and early June.

TARAXACUM OFFICINALE Weber. — *C. bergenstammi* Beck., a few, May 6th and 9th, 1933, Cothill.

ANEMONE NEMOROSA L. — *C. praecox* Zett., a variable series of about fifty specimens, May, 1932, Tubney Wood, Berks; *Platychirus discimanus* Lw., fairly plentiful, May, 1932, Tubney Wood.

* In addition to the Syrphidae actually observed on the flowers, a male *Chilosia chrysocoma* Mg. was found at rest on a tree-stump among the bluebells (*cf.* E. R. Goffe, *J. Ent. Soc. S. Engl.*, **1** (4): 96).

EUONYMUS EUROPAEUS L.—The common *Criorrhina oxyacanthae* Mg. and *C. berberina* F. seem to be specially attached to the flowers of this tree, from which I have obtained nearly all my long series.

RUBUS spp. — *Criorrhina asilica* Fall., a long series of both sexes taken during the first half of June, 1931, 1932 and 1933. Previously I had few specimens in my collection, all of which were taken at flowers of *Crataegus oxyacantha* L.

SALIX spp. — *Melangyna quadrimaculata* Verr., a few in the early spring of most years, Bagley Wood, Berks.*

A. H. Hamm.

Insects at Honey-dew.

For many years past the writer has given attention to honey-dew as an attraction for various insects, especially Diptera. Though the majority attracted are generally common species, occasionally one meets with insects that are more or less uncommon. Last year (1933) the season was very favourable for honey-dew owing to so little rain falling to wash away the Aphidid secretion. Maple trees are probably the best for the purpose, and one was found in Bagley Wood, and was visited on a number of occasions between 16th May and 2nd June with varying success. Two dozen *Chyliza annulipes* Mcq. were captured, also three *C. leptogaster* Pz. and several Pipunculidae, all common except *Pipunculus vittipes* Zett., of which one male was on the bush and two others flying near.

A. H. Hamm.

Unusual behaviour of Bombus agrorum F. (Hym.).

While engaged on a study of the flowers visited by the Bombidae last summer (1933) at Slough, I observed what seemed to me to be rather unusual behaviour on the part of three workers of *B. agrorum*. These bees were visiting the flower spikes of *Digitalis purpurea* L., and, although they sometimes investigated the normal blooms, they refused to visit these, and confined their attentions to flowers from which the corollas had recently fallen. Only the two, or three, calyxes immediately below the open flowers were visited. D. O. Boyd.

Synia musculosa Hübn. (Lep.) in Hants.

A single specimen of this scarce Acronyctid came to light at Micheldever, Hants, on 24th July, 1933. The species has been

* This species is more easily taken by searching the ground in sunny woodland rides during the late afternoon. On April 6th, 1929, twenty specimens, including both sexes, were obtained by this method, and the insect has been seen in similar situations in other years.

recorded from Salisbury, Wilts, by Mr. H. Haynes, and a single specimen came to light some years ago at the Hill Museum, Witley, Surrey. It is an addition to the Hampshire County list of Lepidoptera. C. H. Dixon.

Further records of the food of Cantharidae (Col.).

The short list of food given below comprises an Aphidid, a dead Dipteron and two Cantharid beetles. In two instances the captor is a male, in the others a female.

1. *Cantharis nigricans* Müll., ♀, with an Aphidid, on larch, Tubney, Berks, 9.vi.32.—B. M. Hobby.
2. *C. nigricans* Müll., ♀, observed biting into the abdomen of a dead Cordylurid fly, *Scatophaga stercoraria* L., ♂, which had been killed by an entomophagous fungus, Bagley Wood, Berks, 10.vi.33.—B. M. Hobby.
3. *C. pellucida* F., ♂, with *Podabrus alpinus* Payk. (Col., Cantharidae), Bagley Wood, Berks, 3.vi.32. — B. M. Hobby and F. J. Killington.
4. *C. pellucida* F., ♂, with *Cantharis nigricans* Müll. (Col., Cantharidae), Bagley Wood, Berks, 3.vi.32.—B. M. Hobby and F. J. Killington.

REFERENCES.

Curtis, J. 1828. *Brit. Ent.*, Coleoptera, Part 2, Vol. **2**, pl. 215. [*Cantharis* [*Telephorus*] *livida* L. with Ichneumonid and Empidid prey. *C. fusca* L. with *C. fusca* as prey.]

Morris, F. O. 1837. Is the ' soldier insect ' commonly carnivorous? *Naturalist*, **2** : 331. [Soldier beetle preying on pupa of *Triphaena pronuba* L. [*innuba*] (Lep., Noctuidae).]

Schenk, P. J. 1917. Vijanden van Bladluizen. *Tijdschr. over Plantenziekten, Wageningen*, **23** (6) : 37–45. [*Cantharis* [*Telephorus*] *fusca* L. and allied beetles feeding on aphids in Holland.] [cf. 1918, *Rev. Appl. Ent.*, A., **6** : 136.]

Webster, F. M. 1880 (Second Edition, 1903). Notes upon the food of predaceous beetles. *Bull. Ill. St. Lab. Nat. Hist.*, **1** (3) : 149–152. [In America *Cantharis* [*T.*] *bilineatus* Say is a powerful check on the western locust. *Podabrus tomentosus* Say preys on the cotton wood gall louse *Pemphigus populi-reinae* Fitch and *P. populicaulis* Fitch. The predators sometimes place themselves at the opening of a gall and catch the mature lice as they attempt to escape. Sometimes they extract the lice from the cavity.]

Other records are given by B. M. Hobby, 1932, Prey of Cantharidae (Coleoptera), *J. Ent. Soc. S. Engl.*, **1** : 6, and F. J. Killington, 1932, Predacious insects as enemies of Neuroptera, *J. Ent. Soc. S. Engl.*, **1** : 31–3.

B. M. Hobby.

Tubifera (= Eristalis) tenax Linn. (Dipt., Syrph.) in flight in December.

On the morning of 31st December, 1933, a female of this Hover Fly entered my study window at King's Somborne,

Hants, during a spell of winter sunshine and flew about for some time before settling down in a corner.

The next three days were cold and sunless, but on the 4th January another spell of sunshine roused the insect into activity again, and it escaped through the open window.

E. Rivenhall Goffe.

Diptera taken in Scotland in 1933.

My attention was given almost entirely to the Dipterous families Tabanidae and Syrphidae, particularly the latter.

In the following notes those captures and observations dated 19th June and after are (unless otherwise stated) my own. Those dated before 19th June are by Mr. Philip Harwood, who arrived at Aviemore at the end of May, and who was good enough to take for me such interesting Diptera as came under his notice. As all the dates noted are in 1933, the year has been omitted to avoid constant repetition. All the localities are in Inverness-shire unless otherwise stated.

TABANIDAE.

Individuals of this family were fairly numerous though but seven species were represented; the following is a list of those observed. The nomenclature used is that of my paper published in 1931 (*Trans. Ent. Soc. S. Engl.*, **6**: 43-114).

Silviinae.

Chrysops relictus Meig. This species occurred sparingly near Loch Alvie on 25th June, and also at Granish. The single specimens taken from each locality have the antennae almost all black—just a touch of fulvous colouring appears on the underside of each basal segment. Both are rather large specimens.

Chrysozoninae.

Chrysozona pluvialis Linn. Occurred sparingly near Loch Alvie, 25th June.

C. crassicornis Whlbg. Fairly common in suitable marshy places and alongside the mountain burns. The specimens had the ground colour of the thorax and abdomen deep black, with the white spots and lines somewhat sharply contrasted; they were in consequence rather conspicuous and quite lacked the drab appearance of *C. pluvialis*. The species was particularly abundant on the afternoon of the 24th June by the side of the Ciste Burn on the upper edge of Glenmore Forest at an altitude of about 1,500 feet. Mr. Harwood also took it at John O'Groats, Caithness, on 6th June.

Tabaninae.

Tabanus sudeticus Zell. This fine species, the largest British Dipteron, began to emerge the last few days in June, and was noted at Granish (29th June and 1st July) and by Loch Garten (28th June). The specimens were typical.

Sziladynus luridus Fall. This early species was found in numbers by Mr. Harwood near Loch Garten on 4th June, and odd specimens were taken there and at Granish from 19th—30th June. A specimen taken at Loch Garten on 4th June has the third and subsequent visible abdominal segments not extended, their sternites being visible inside the second segment.

S. distinguendus Verr. This is easily the commonest Tabanid in the district, and was found to be fairly widely distributed. Interesting variation was observed between the specimens found in the Spey valley and those found a little higher up by the lochs.

The 'valley' form (from Granish) had a narrower blackish dorsal abdominal band with concave margins, and with the wider limits of the 'loch' form indicated only by the pubescence being black instead of golden; whilst the orange abdominal colouring was uninterrupted on the sides of the third visible segment, and formed a pair of roundish orange spots on the fourth.

The form found by the lochs (Loch Garten, Loch Morlich, etc.) had a broad parallel-sided dorsal abdominal band in which the outline of the narrower concave-sided band of the 'valley' form was quite lost; whilst the orange side-colouring of both third and fourth visible abdominal segments was heavily obscured by blackish suffusion, though still bearing golden pubescence. The palpi of the 'loch' form also appear darker through bearing more black hairs.

Four males of the 'valley' form were taken at Granish, 16th—27th June, in each case sitting on a fence in the early part of the morning. No males of the 'loch' form were seen.

Dissections of these two forms and of South of England material did not reveal any differences in the genitalia.

S. montanus Meig. Early individuals of this species occurred sparingly at Granish, Loch Garten, Loch Beanaidh, and Loch Morlich 22nd—30th June. The species is usually abundant there in July.

SYRPHIDAE.

As in the south of England, Syrphidae appeared in numbers in the early spring, but with few exceptions became less numerous as the season progressed. The conspicuous exceptions were *Melanostoma mellinum* Linn., *Platychirus peltatus* Meig., *Didea intermedia* Loew., and *Epistrophe vittigera* Zett., which were

abundant. The first named was easily the most abundant Syrphid in the area and occurred at higher altitudes than any other species of the family.

The nomenclature used for the following notes is that of Lindner's 'Die Fliegen der Palaearktischen Region,' Syrphidae, 1930-32, amended where necessary.

Chilosiinae.

Pipiza noctiluca Linn. Granish, 27th June.

Heringia virens Fabr. Granish, 15th June; Aviemore, 25th June.

Orthoneura geniculata Meig. Speybridge, 29th June (Mr. Collin).

Chrysogaster hirtella Loew. Granish, 27th June. This species is omitted altogether from Lindner's 'Die Fliegen'; it has apparently been overlooked by Dr. Sack as he does not even place the name in synonymy.

Chilosia albitarsis Meig. Granish, 26th June; Ballinluig (Perthshire), 2nd July.

Ch. bergenstammi Beck. Granish 27th and 29th June.

Ch. fraterna Meig. John O'Groats (Caithness), 6th June, in numbers; Nairn (Nairnsh.), 30th June.

Ch. honesta Rond. Aviemore, 30th May.

Ch. illustrata Harr. Nairn (Nairnsh.), 30th June, in numbers, on flowers of white Umbelliferae. A fine large form.

Ch. longula Zett. Culbin Sand Hills (Nairnsh.), 2nd July (Mr. Collin).

Ch. nasutula Beck. Granish, 22nd June to 1st July, in numbers, on sunny flowery banks in sheltered situations. Glen Feshie, 1st July; Ballinluig (Perthsh.), 2nd July; Nairn (Nairnsh.), 30th June. (This is the *Ch. antiqua* of Verrall's 'British Flies.')

Ch. proxima Zett. Granish, 25th June.

Ch. scutellata Fall. Granish, 29th June.

Callicera yerburyi Verr. A specimen of what appeared to be this species was seen at Granish on 27th June hovering near a car. Mr. Collin, who had a much closer view of the insect than I did, was able to distinguish its antennae and was positive as to its identity: I can only add that from a few paces further off it *looked like* a Syrphid. At the same time it must not be overlooked that Tabanidae do sometimes hover and are well known to be attracted by cars. *C. yerburyi* had been taken close by in a previous year by Mr. Harwood, but in August; the interest of the observation lies in the early date, as the species is, so far as is known, an autumn one which has only, I think, been taken in August. The male is still undescribed, the few recorded captures being all females and all from Scotland.

PELECOCERINAE.

Chamaesyrphus scaevoides Fall. Loch Garten, 21st June; Granish, 25th—30th June. On Umbelliferae and green patches in not too dense pine woods. Bears a strong superficial resemblance to the common *Melanostoma mellinum* Linn.

SPHEGININAE.

Sphegina clunipes Fall. Granish, 22nd June.
Neoascia floralis Meig. Granish, 15th June.
N. dispar Meig. Speybridge, 29th June (Mr. Collin).

SYRPHINAE.

Platychirus angustatus Zett. Ballinluig (Perthsh.), 2nd July, a very small female specimen of the extreme form noted by Verrall (1901, Brit. Flies, **8** : 296).
Pl. clypeatus Meig. Aviemore, 25th June.
Pl. discimanus Loew. Glenmore, 26th June.
Pl. fulviventris Macq. Aviemore, 7th July (Mr. Collin).
Pl. peltatus Meig. Granish, Aviemore, Glen Feshie, Nethy Bridge, 19th—30th June, abundant. Ballinluig (Perthsh.), 2nd July. The long series taken were almost entirely males.
Pl. podagratus Zett. Aviemore, 25th June; Granish, 27th June; Ballinluig (Perthsh.), 2nd July.
Pl. scambus Staeg. Nairn (Nairnsh.), 30th June.
Pl. tarsalis Schumm. Glen Feshie, 1st July.
Melanostoma mellinum Linn. Granish, Aviemore, Glen Feshie, Nethy Bridge, Glenmore Forest, etc., 16th—30th June, abundant. The melanoid form of the female, which Verrall considered to be *M. dubium* Zett., was found at the higher elevations from Glenmore Forest up the slopes of Cairn Gorm.
M. scalare Fabr. Glen Feshie, 1st July.
Ischyrosyrphus glaucius Linn. Granish, 29th June.
Syrphus lucorum Linn. Granish, 27th June.
Epistrophe auricollis Meig., form *maculicornis* Meig. Granish, 20th—27th June.
E. lineola Zett. Loch Garten, 21st June (Mr. Collin).
E. bifasciata Fabr. Granish, 25th June.
E. cinctella Zett. Loch Garten, 4th June; Granish, 27th June.
E. compositarum Verr. Granish, 27th June—2nd July; Nairn (Nairnsh.), 30th June.
E. lincola Zett. Loch Garten, 21st June (Mr. Collin).
E. vittigera Zett. Granish, Aviemore, 16th—30th June, abundant. Glen Feshie, 1st July. Most of the specimens examined were females.
E. (*sp. incert.*). A somewhat teneral male taken at Aviemore, 30th May, by Mr. Harwood amongst a number of *E. vittigera,* which, whilst resembling that species in structural characters,

has the abdominal markings and slightly hairy eyes of *E. punctulata* Verr., but its antennae are all black. It does not exactly fit any described palaearctic species, and its identity must await further material, including the female sex.

Didea alneti Fall. Granish, 24th and 28th June, two females on flowers in a garden, two others seen but not captured.

D. intermedia Loew. Loch Garten, 4th June; Granish, 20th—30th June, in numbers.

Syrphidis lunulatus Meig. Loch Garten, 4th June; Granish, 20th—30th June, on low-growing flowers in numbers but scattered over a wide area. Several specimens were taken which were apparently males, but which had the eyes more or less separated (*vide* Verrall, 1901, Brit. Flies, **8**: 353-4).

S. tricinctus Fall. Aviemore, 30th May; Granish, 16th—27th June.

S. venustus Meig. Aviemore, 30th May; Granish 26th—28th June, not nearly so numerous as *S. lunulatus*.

S. annulipes Zett. Aviemore, Granish, Loch Garten, 30th May to 30th June, in numbers, on flowers.

S. lapponicus Zett. Granish, 27th and 28th June, one male and one female on flowers. These specimens conform much more closely to continental material than the single somewhat teneral specimen referred to (under *S. arcuatus*) by Verrall.

S. torvus Ost.-Sack. Granish, 20th—27th June.

S. ribesii Linn. Granish, 29th June; Nairn (Nairnsh.), 30th June.

S. vitripennis Meig. Granish, 29th June.

S. nitidicollis Meig. Granish, 29th June.

S. arcuatus Fall. Loch Garten, one male, 4th June. This specific name is at present being applied to what in all probability are several distinct species, and it has not yet been made clear to which of them the name *arcuatus* Fall. properly belongs (*vide* J. E. Collin, 1931, *Ann. Mag. Nat. Hist.*, 10 (**7**): 67). This species is not included in Verrall's 'British Flies,' and I have not seen any published record of its having been taken in Britain other than the statement in Mr. Collin's paper above referred to that it had occurred in Scotland.

S. latilunulatus Coll. A single example of what is probably the hitherto unknown and undescribed female of this species was taken at Granish 27th June. Unfortunately no males were taken to make the identity certain, though a male was taken at Nethy Bridge in 1911. The male sex was described by Mr. Collin in pages 178-80 of the *Entomologist's Monthly Magazine* for August, 1931. This female, like the male, bears a strong likeness to *S. nitens* Zett. and (as prophesied by Mr. Collin, *l.c.*, p. 179) has no side dust spots on the frons.

Sphaerophoria menthastri Linn. form *picta* Meig. Aviemore, Granish, 25th—27th June.

CHRYSOTOXINAE.

Chrysotoxum arcuatum Linn. Granish, 20th June—1st July, on heather; a number of specimens were seen and taken, but it was never found in numbers.

MICRODONTINAE.

Microdon eggeri Mik. Loch Garten, 4th June. (This is the *M. latifrons* of Verrall.)

VOLUCELLINAE.

Volucella pellucens Linn. Granish, 27th June.

ERISTALINAE.

Eristalis arbustorum Linn. John O'Groats (Caithness), 6th June.
E. abusivus Coll. John O'Groats (Caithness), one male, 6th June. This capture extends the known range of this species in Britain to the far north of Scotland.
E. horticola de Geer. Glen Feshie, 1st July.
E. intricarius Linn. Ballinluig (Perthsh.), 2nd July.
E. nemorum Linn. Granish, 22nd July.
E. rupium Fabr. Loch Garten, 23rd June; Granish, 27th—28th June.
Helophilus hybridus Loew. Granish, 25th June.
Eurinomyia lineata Fabr. Aviemore, 30th May.
Lampetia equestris Fabr., form *validus* Meig. Nairn (Nairnsh.), one female, 30th June; a somewhat northerly record for this species.

CINXIINAE.

Cinxia borealis Fall. Granish, 1st July.
C. lappona Linn. Loch Garten, 4th June; John O'Groats (Caithness), 6th June; Granish, 26th June.

ZELIMINAE.

Syritta pipiens Linn. Granish, 20th—30th June.
Zelima abiens Meig. Granish, 16th—27th June; a somewhat northerly record for this species.
Z. florum Meig. Granish, 16th—28th June, in fair numbers.
Z. segnis Linn. Granish, 27th June.

STRATIOMYIDAE.

Microchrysa flavicornis Meig. Glenmore Forest, 26th June, two males.
M. cyaneiventris Zett. Ballinluig (Perthsh.), 2nd July, one male.

RHAGIONIDAE.

Rhagio scolopacea Linn. Granish, 1st July.
Rh. notatus Meig. Tongue (Sutherland), 7th June, in numbers (P. Harwood).

THEREVIDAE.

Thereva plebeia Linn. Nairn (Nairnsh.), 30th June, one male.

ASILIDAE.

Isopogon brevirostris Meig. Granish, 16th June, one female.

EMPIDIDAE.

Empis borealis Linn. Aviemore, 30th May, one male (P. Harwood).

CONOPIDAE.

Sicus ferrugineus Linn. Granish, 27th June, one female.

Myopa buccata Linn. Aviemore, 30th May, one female (P. Harwood).

HIPPOBOSCIDAE.

Ornithomyia avicularia Linn. Nethy Bridge, early June, one female (P. Harwood).

E. Rivenhall Goffe.

Some Diptera collected in the South of England in 1930-33.

Useful and interesting collecting trips in Hampshire and neighbouring counties (though marred by much inclement weather) were made by us in August Bank Holiday week of 1930-32 and at Whitsuntide, 1931 and 1933. Confining our attention largely to the Tachinidae and Anthomyidae, we were able to secure no less than 153 species of the former and 144 of the latter, including several new to the British list. Notes on a few of the more interesting captures have already been published (Collin, 1930, *Ent. Mon. Mag.*, **66**: 226-230; Wainwright, 1932, *Trans. Ent. Soc. Lond.*, **80**: 405-425, and 1933, *Ent. Mon. Mag.*, **69**: 160-163), and others will be found at the end of this paper, but in view of the fact that our captures certainly include many additions to the known local fauna we now offer a full list.

We are glad to place on record our appreciation of the very great assistance accorded to us by entomological colleagues living in the district, especially by Dr. F. H. Haines, of Linwood, and Mr. E. Rivenhall Goffe, of King's Somborne, both of whom repeatedly went out of their way to make our visits pleasant and profitable.

The localities for the various species are indicated by the following abbreviations placed after their names :—

A.—Arne, Dorset.
B.Wd.—Bentley Wood, Hants.
Br.—Breamore, Hants.
Cam.—Camberley, Surrey.
Ch.—Chobham Ridges, Surrey.
F.—Farley Down, Hants.
Faw.—Fawley, Hants.
Gen.—Generally distributed.
Har.—Harewood Forest, Hants.
Heng.—Hengistbury Head, Hants.
Hrn.—Hurn, Hants.
K.S.—King's Somborne, Hants.
L.Wd.—Lord's Wood, Hants.
N.F.—New Forest, Hants.
Par.Wd.—Parnholt Wood, Hants.
Pig.Wd.—Pignall Wood, Hants.
R.—Rempstone Heath, Dorset.
St.—Studland Heath, Dorset.

STRATIOMYIDAE.

Pachygaster atra Pnz. (Br.).
Stratiomys potamida Mg. (Faw.).
Chloromyia formosa Scop. (F.).
Chorisops tibialis Mg. (F.).

LEPTIDAE.

Xylophagus ater Mg. (N.F.).
Leptis lineola F. (Hur.).
Ptiolina obscura Fln. (F., L.Wd.).

TABANIDAE.

Haematopota pluvialis L. (Gen.).
,, *bigoti* Gob. (A.).
Therioplectes distinguendus Verr. (Gen.).
,, *montanus* Mg. (Hur.).
,, *solstitialis* Mg. (N.F.).
Atylotus fulvus Mg. (Gen.).
,, *latistriatus* Br. (A.).
Tabanus bromius L. (Gen.).
,, *cordiger* W. (Ch.).
,, *glaucopis* Mg. (F.).
,, *maculicornis* Ztt. (Cam., N.F.).
,, *miki* Br. (N.F.).
,, *perplexus* Verr. (N.F.).
,, *sudeticus* Zell. (Ch., Cam.).
Chrysops relictus Mg. (St.).
,, *sepulcralis* F. (R.).

CYRTIDAE.

Acrocera globulus Pnz. (N.F., Ch., F.).

BOMBYLIIDAE.

Bombylius minor L. (A., St.).
Anthrax fenestrata Fln. (Ch., St.).

THEREVIDAE.

Thereva annulata F. (St.).

ASILIDAE.

Dysmachus trigonus Mg. (Gen.).
Machimus atricapillus F. (F.).
,, *rusticus* Mg. (F.).
Epitriptus cingulatus F. (Ch.).
Isopogon brevirostris Mg. (F.). (A., Ch.).
Dioctria baumhaueri Mg. (A., Ch.).
,, *linearis* Mg. (F.).

EMPIDIDAE.

Drapetis curvipes Mg. (=*aterrima* Curt.) (A., Heng.).
Tachydromia albiseta Pnz. (Hur.).
Trichina bilobata Coll. (F.).
Oedalea holmgreni Ztt. (L.Wd.).
,, *stigmatella* Ztt. (L.Wd.).
Gloma fuscipennis Mg. (L.Wd.).
Rhamphomyia anomalipennis Mg. (N.F.).
,, *longipes* Mg. (N.F.).
,, *micropyga* Coll. (B.Wd.).
Empis concolor Verr. (B.Wd.).
Hilara aëronetha Mik (N.F.).
,, *lundbecki* Frey (Heng.).
,, *pilosa* Ztt. (N.F.).
,, *rejecta* Coll. (N.F.).
Synamphotera pallida Lw. (F.).

DOLICHOPODIDAE.

Psilopus laetus Mg. (A., Heng.).
Dolichopus atripes Mg. (R.).
,, *nubilus* Mg. (A.).
,, *vitripennis* Mg. (N.F., R.).
Chrysotus cilipes Mg. (N.F.).
Diaphorus nigricans Mg. (N.F.).
Thrypticus bellus Lw. (N.F.).
Rhaphium longicorne Fln. (N.F.).
Porphyrops consobrina Ztt. (Heng.).
,, *crassipes* Mg. (N.F.).
1. *Medeterus dendrobaenus* Kow.
Hydrophorus praecox Lehm. (Heng.).
Teuchophorus monacanthus Lw. (N.F.).
Bathycranium bicolorellum Ztt. (N.F.).

SYRPHIDAE.

Paragus tibialis Fln. (F.).
Pipizella virens F. (F., N.F., St.).
Heringia heringi Ztt. (F., B.Wd.).
Pipiza austriaca (Mg.) Lndbk. (F.).
,, *notata* Mg. (N.F.).
Chrysogaster macquarti Lw. (N.F., Remp., St.).
,, *hirtella* Lw. (N.F.).
,, *virescens* Lw. (N.F., L.Wd.).
Liogaster splendida Mg. (St.).
Chilosia albitarsis Mg. (N.F., Pig.Wd.).
,, *antiqua* Mg. (=*sparsa* Lw.) (N.F.).
,, *barbata* Lw. (Br.).
,, *bergenstammi* Beck. (F.).

Chilosia carbonaria Egg. (F., Pig.Wd.).
,, *fraterna* Mg. (N.F.).
,, *longula* Zett. (N.F., Ch.).
,, *proxima* Zett. (F.).
,, *pulchripes* Lw. (L.Wd.).
,, *scutellata* Fln. (A., F.).
,, *soror* Zett. (F.).
,, *variabilis* Pnz. (F.).
,, *vulpina* Mg. (F.).
Platychirus scutatus Mg. (F.).
Pyrophaena granditarsa Forst. (N.F.).
,, *rosarum* F. (N.F., St.).
Melanostoma mellinum L. (Gen.).
Xanthandrus comtus Harr. (N.F.).
Calabomba selenitica Mg. (St.).
Syrphus auricollis Mg. (F.).
,, *cinctellus* Zett. (Par.Wd.).
,, *corollae* F. (St.).
,, *grossulariae* Mg. (F., Br.).
,, *lineola* Zett. (F.).
,, *nitidicollis* Mg. (B.Wd.).
,, *ribesii* L. (Gen.).
,, *torvus* O.S. (F.).
,, *umbellatarum* F. (Br., St.).
,, *venustus* Mg. (N.F.).
,, *vitripennis* Mg. (Gen.).
Xanthogramma ornatum Mg. (F.).
Pelecocera tricincta Mg. (N.F.).
Brachyopa bicolor Fln. (Par.Wd., F.).
Rhingia campestris Mg. (Gen.).
Volucella inanis L. (F.).
,, *inflata* F. (F.).
Eristalis abusivus Coll. (Heng.).
,, *arbustorum* L. (Gen.).
,, *horticola* Deg. (N.F.).
,, *intricarius* L. (N.F.).
,, *sepulcralis* F. (N.F.).
Helophilus lunulatus Mg. (N.F.).
Criorrhina berberina F. (N.F.).
,, *oxyacanthae* Mg. (F., N.F.).
Xylota abiens Mg. (N.F., L.Wd.).
,, *nemorum* F. (N.F.).
,, *segnis* L. (N.F.).
Eumerus ornatus Mg. (B.Wd.).
,, *sabulonum* Fln. (St.).
Chrysochlamys cuprea Scop. (F.).
Arctophila mussitans F. (N.F.).
Sericomyia borealis Fln. (N.F., R.).
Chrysotoxum cautum Harr. (N.F.).
,, *elegans* Lw. (F.).
Chrysotoxum festivum L. (St., R.).
Microdon mutabilis L. (N.F.).

PIPUNCULIDAE.

Pipunculus confusus Verr. (F.).
,, *flavipes* Mg. (B.Wd.).
,, *flavitarsis* Coll. (Heng.).
,, *geniculatus* Mg. (A., N.F.).
,, *nigritulus* Zett. (A., F.).
,, *littoralis* Beck. (St.).
2. ,, *semifumosus* Kow. (A.).
,, *terminalis* Thom. (A., N.F.).
,, *varipes* Mg. (F.).
,, *xanthopus* Thom. (Heng.).

PHORIDAE.

Paraspinophora domestica Wood (A.).
Dohrniphora florea F. (F.).
Aphiochaeta paludosa Wood (Faw.).
Metopina galeata Hal. (F., N.F.).
Phalacrotophora fasciata Fln. (F.).

TACHINIDAE.

Servillia lurida F. (N.F.).
Echinomyia fera L. (F.).
,, *ferox* Pnz. (A).
Micropalpus pudicus Rdi. (F., Har.).
,, *vulpinus* Fln. (Gen.).
Gymnochaeta viridis Fln. (N.F.).
Ernestia conjugata Ztt. (N.F.).
,, *nielseni* Villen. (F., N.F.).
,, *rudis* Fln. (F., N.F.).
,, *vagans* Mg. (N.F.).
,, *vivida* Zett. (F.).
Lypha dubia Fln. (N.F.).
Lydina aenea Mg. (F., N.F., Par.Wd.).
Winthemia quadripustulata F. (St., F.).
,, *variegata* Mg. (F.).
Carcelia comata Rdi. (F., N.F., Cam.).
Exorista confinis Fln. (F.).
,, *fimbriata* Mg. (N.F., St., A.).
,, *hortulana* Mg. (F.).
,, *lota* Mg. (N.F.).
,, *tritaeniata* Rdi. (F.).

Zenillia libatrix Mg. (A., Har.).
,, *roseana* B.B. (F., B.Wd.).
Phryxe nemea Mg. (F., N.F.).
,, *vulgaris* Fln. (F., N.F.).
Phryno vetula Mg. (F., N.F.).
Pelmatomyia phalaenaria Rdi. (N.F.).
Epicampocera conspersa Mg. (F., N.F., B.Wd.).
,, *succincta* Mg. (F.).
Ceromasia sordidisquama Zett. (F., N.F.).
Paraphorocera senilis Mg. (A., F.).
Lydella nigripes Fln. (N.F.).
,, *stabulans* Mg. (F., A., Heng.).
Ptychomyia selecta Mg. (Gen.).
Compsilura concinnata Mg. (F.).
Pales pavida Mg. (F., N.F.).
Parasetigena silvestris Dsv. (N.F.).
Phorocera caesifrons Mcq. (Gen.).
Meigenia bisignata Mg. (F.).
,, *mutabilis* Fln. (F.).
,, *pilosa* Bar. (F., Br., B.Wd.).
Viviania cinerea Fln. (F.).
Tachina baranoffi Wain. (N.F.).
,, *erucarum* Rdi. (F.).
,, *larvarum* L. (Gen.).
,, *minor* Wain. (F.).
,, *rustica* Mg. (F.).
Monochaeta albicans Fln. (Gen.).
Gonia capitata Deg. (F.).
Voria trepida Mg. (F., N.F.).
,, *curvinervis* Zett. (Hur.).
Anachaetopsis ocypterina Zett. (Hur.).
Wagneria nigrans Mg. (A.).
Ptychoneura cylindrica Fln. (F.).
,, *rufitarsis* Mg. (Pig.Wd.).
Rhacodineura antiqua Mg. (F.).
Phytomyptera nidiventris Rdi. (A.).
Bucentes geniculata Deg. (Gen.).
,, *maculata* Staeg. (Par.Wd., St.).
Blepharomyia amplicornis Ztt. (F., N.F.).
Digonochaeta spinipennis Mg. (F., Pig.Wd.).
Actia anomala Zett. (F.).
,, *antennalis* Rdi. (F.).
,, *crassicornis* Mg. (Gen.).
,, *pilipennis* Fln. (Gen.).
Trichoparia seria Mg. (F.).
Craspedothrix zonella Zett. (F.).
Arrhinomyia tragica Mg. (Ch.)
Apatelia innoxia Mg. (F., N.F., Ch., Hur.).
Degeeria collaris Fln. (F., N.F.).
,, *luctuosa* Mg. (F., N.F., Par.Wd., Hur.).
Loewia foeda Mg. (F.).
,, *petiolata* Dsv. (F.).
,, *phaeoptera* Mg. (F.).
Macquartia grisea Fln. (F.).
,, *nitida* Zett. (F., Heng., B.Wd.)
,, *nubilis* Rdi. (F., Faw.).
,, *praefica* Mg. (F.).
,, *tenebricosa* Mg. (F., N.F.).
Minella chalybeata Mg. (F.).
,, *nigrita* Fln. (F.).
Rhinotachina modesta Mg. (F.).
Bithia spreta Mg. (F., N.F.).
Aphria longirostris Mg. (F.).
Myiobia fuscana Dsv. (F.).
,, *inanis* Fln. (F.).
,, *tibialis* v. Ros. (F.).
,, *vacua* Rdi. (F.).
Rhynchista prolixa Mg. (F.).
Eriothrix rufomaculata Deg. (Gen.).
Lophosia fasciata Mg. (F.).
Ocyptera interrupta Mg. (Heng.).
Phyllomyia volvulus F. (F.).
Thelaira nigripes F. (N.F., Hur.).
Trixa oestroidea Dsv. (Ch.).
Atropidomyia irrorata Mg. (F.).
Estheria cristata Mg. (Ch., N.F.).
Dexia rustica F. (F.).
Dexiosoma caninum F. (F.).
Prosena sybarita F. (A., St.).
,, *luculliana* Rdi. (F.).
Dinera grisescens Fln. (St., Heng.).
Euplesina maculata Fln. (F., Hur.).
Frauenfeldia rubricosa Mg. (Heng.).
Phyto melanocephala Mg. (F.).
Rhinophora lepida Mg. (Gen.).
Sarcophaga agnata Rdi. (F.).
,, *aratrix* Pand. (F.).
,, *carnaria* L. (Gen.).
,, *clathrata* Mg. (F., Pig.Wd.).
,, *crassimargo* Pand. (F., Faw.).
,, *dissimilis* Mg. (F., Har.).
,, *filia* (Rdi.) Pand. (F.).
,, *frenata* Pand. (N.F.).

Sarcophaga haemorrhoa Mg. (F., B.Wd.).
,, *incisilobata* Pand. (F., St.).
,, *melanura* Mg. (Heng., St.).
,, *nigriventris* Mg. (F., St.).
,, *offuscata* Mg. (F.).
,, *pumila* Mg. (F.).
,, *rosellei* Bötts. (F.).
,, *scoparia* Pand. (F.).
,, *setipennis* Rdi. (F.).
,, *similis* Pand. (A.).
,, *sinuata* Mg. (A., Heng.).
,, *striata* F. (F.).
,, *vicina* Pand. (F.).
Blaesoxipha gladiatrix Pand. (N.F., Ch.).
,, *rossica* Villen. (F.).
Sarcophila latifrons Fln. (St.).
Nyctia halterata Pnz. (F., Br.).
Engyzops pecchiolii Rdi. (F.).
Morinia nana Mg. (F.).
Brachycoma devia Fln. (St., F., Br.).
Miltogramma punctatum Mg. (Ch., R., St.).
Metopia campestris Fln. (N.F.).
,, *leucocephala* Rossi (N.F., St.).
Sphecapata conica Fln. (St., N.F.).
Pollenia rudis F. (Gen.).
,, *vespillo* F. (Ch., N.F.).
Phormia sordida Zett. (Br.).
Lucilia caesar L. (F.).
,, *illustris* Mg. (F., B.Wd.).
,, *richardsi* Coll. (F., Par.Wd., B.Wd.).
Onesia aculeata Pand. (Gen.).
,, *agilis* Mg. (Gen.).
Melinda anthracina Mg. (Br.).
,, *coerulea* Mg. (Br.).
Syntomogaster fasciata Mcq. (F., B.Wd.).
Cinochira atra Ztt. (A.).
3. *Leucostoma simplex* Fln. (Hur.).
Allophora hemiptera F. (F.).
Parallophora pusilla F. (Gen.).

ANTHOMYIDAE.

4. *Pseudomorellia albolineata* Fln. (F.).
5. *Lyperosia irritans* L. (A.).
6. *Muscina pabulorum* Fln. (N.F.).
7. *Phaonia basalis* Ztt. (F., N.F.).
,, *cincta* Ztt. (N.F.).
,, *erratica* Fln. (F.).
Phaonia fuscata Fln. (Ch.).
,, *incana* W. (Gen.).
,, *palpata* Stein (=*trigonalis* Mde. *nec* Mg.). (F., N.F., Par.Wd.).
,, *perdita* Mg. (F., Heng.).
,, *rufipalpis* Mcq. (F., Hur.).
,, *serva* Mg. (N.F.).
,, *signata* Mg. (St.).
,, *vagans* Fln. (N.F.).
,, *variegata* Mg. (=*populi* Wlk. *nec* Mg.) (Har., Par.Wd.).
8. *Hebecnema umbratica* Mg. (A.).
,, *vespertina* Fln. (Har.).
Mydaea urbana Mg. (N.F., R.).
9. ,, *setifemur* Ringd. (N.F.).
10. *Helina allotalla* Mg. (Gen.).
,, *anceps* Zett. (Cam., Heng., St.).
,, *atripes* Mde. (F.).
11. ,, *cilipes* Schnbl. (St.).
,, *duplicata* Mg. (Gen.).
,, *duplaris* Zett. (=*communis* Mde.) (Heng., F.).
,, *depuncta* Mg. (N.F.).
,, *latitarsis* Ringd. (=*dispar* Mde. *nec* Fln.) (F.).
,, *obscurata* Mg. (A., Heng.).
,, *pertusa* Mg. (N.F.).
,, *protuberans* Ztt. (St.).
,, *quadrimaculata* Fln. (A.).
,, *setiventris* Ringd. (=*duplaris* Stein *nec* Ztt.) (Ch., F., Br.).
Myiospila meditabunda F. (F., N.F.).
12. *Enoplopteryx ciliatocostata* Ztt. (N.F., Ch., R.).
Alloeostylus simplex W. (F.).
13. *Lasiops semicinerea* W. (N.F.).
14. *Lophosceles cristatus* Ztt. (=*pulcher* Mde.) (N.F., F., Par.Wd.).
,, *mutatus* Fln. (=*semipellucidus* Ztt.) (N.F.).
15. *Limnophora maculosa* Mg. (N.F.).
,, *notata* Fln. (Heng.).
,, *triangula* Fln. (N.F.).
Spilogona aërea Fln. (N.F., Heng.).
,, *humilis* Ztt. (N.F.).
,, *denigrata* Mg. (N.F., Hur.).

Spilogona marina Collin (A., Heng.).
,, *surda* Ztt. (N.F., Heng.).
,, *vana* Ztt. (N.F.).
Lispe litorea Fln. (=*pilosa* Lw.) (Heng.).
,, *nana* Mcq. (=*pulchella* Lw.) (Heng.).
,, *pygmaea* Fln. (Heng.).

16. *Fannia aërea* Ztt. (N.F., Par.Wd.).
,, *armata* Mg. (Har., F.).
,, *coracina* Lw. (N.F., Br.).
,, *difficilis* Stein (F.).
,, *fuscula* Fln. (Gen.).
,, *hamata* Mcq. (Par.Wd.).
,, *monilis* Hal. (F.).
,, *mutica* Ztt. (F.).
,, *nigra* Mall. (F.).
,, *parva* Stein (N.F.).
,, *polychaeta* Stein (Gen.).
,, *pretiosa* Schin. (N.F.).
,, *serena* Fln. (Gen.).
,, *sociella* Ztt. (Gen.).
,, *umbrosa* Stein (Par.Wd.).
,, *verralli* Stein (A.).
Azelia aterrima Mg. (K.S.).
,, *triquetra* W. (K.S.).
,, *Zetterstedti* Rdi. (N.F., K.S.).
Hydrotaea albipuncta Zett. (F.).
,, *armipes* Fln. (F.).
,, *borussica* Stein (N.F.).
,, *ciliata* F. (F., N.F.).
,, *cyrtoneurina* Ztt. (N.F., Faw.).
,, *dentipes* Mg. (Gen.).
,, *meteorica* L. (St., Br.).
,, *occulta* Mg. (F., N.F.).
,, *palaestrica* Mg. (B.Wd.).
,, *parva* Mde. (N.F.).
,, *tuberculata* Rdi. (A., F.).
Hydrophoria conica W. (Gen.).
,, *ruralis* Mg. (=*anthomyiea* Rdi.) (N.F.).

17. *Acroptena ambigua* Fln. (N.F.).
,, *caudata* Ztt. (N.F.).
,, *divisa* Mg. (Heng., St.).
,, *villosa* Ringd. (N.F.).
Hylemyia strigosa F. (Gen.).
,, *variata* Fln. (Gen.).

18. ,, *variabilis* Stein (F.).

19. *Hylemyza lasciva* Ztt. (Gen.).

20. *Melinia pullula* Ztt. (Gen.).

21. *Acrostilpna latipennis* Ztt. (N.F.).

22. *Pycnoglossa flavipennis* Fln. (Hur.).
Chirosia crassiseta Stein (N.F.).

23. *Pegoplata virginea* Mg. (N.F., A.).

24. *Pegomyia bicolor* W. (Har., N.F.).
,, *fulgens* Mg. (N.F.).
,, *flavipes* Fln. (Har.).
,, *hyoscyami* var. *betae* Curt. (Heng.).
,, *socia* Fln. (Heng.).
,, *transversalis* Ztt. (N.F.).
,, *versicolor* Mg. (Par.Wd.).

25. *Pegohylemyia brunneilinea* Ztt. (=*seticrura* Rdi.) (N.F.).
,, *discreta* Mg. (Gen.).
,, *fugax* Mg. (=*pudica* Rdi.) (F., N.F.).

26. ,, *sonchi* Hardy (Heng.).
Phorbia genitalis S. & D. (=*sepia* Auct.) (Heng., St.).

27. ,, *grisea* Ringd. (N.F.).
Anthomyia procellaris Rdi. (Par.Wd.).
,, *pluvialis* L. (F.).

28. *Calythea pratincola* Pnz. (B.Wd.).

29. *Opsolasia roederi* Kow. (B.Wd.).

30. *Paregle radicum* L. (Gen.).
,, *cinerella* Fln. (A., Heng., K.S.).

31. *Nupedia aestiva* Mg. (=*sulciventris* Ztt.) (Gen.).
,, *dissecta* Mg. (=*ignota* Rdi.) (Gen.).

32. *Delia brassicae* Bouché (=*floccosa* Mcq.) (F., Br.).

33. ,, *carduiformis* Schnbl. (Par.Wd.).
,, *cilicrura* Rdi. (Gen.).
,, *criniventris* Ztt. (B.Wd.).
,, *exigua* Mde. (Par.Wd., Har.).
,, *intersecta* Mg. (=*neglecta* Mde.) (F., Br.).

34. ,, *nuda* Stein (F., Br.).

35. ,, *pilipyga* Villen (F., Faw.).
,, *trichodactyla* Rdi. (Gen.).

36. *Hammomyia grisea* Fln. (Gen.).
Hylephila buccata Fln. (F., Faw.).
,, *personata* Collin (F., St., Har.).
Limnospila albifrons Ztt. (Heng.).

Dexiopsis lacteipennis Ztt. (Heng.).
37. *Lispocephala alma* Mg. (=*ungulata* Rdi. of Mde.) (N.F.).
,, *erythrocera* Dsv. (Faw., St.).
,, *verna* F. (N.F.).
Pseudocoenosia abnormis Stein (Ch., N.F.).
,, *longicauda* Ztt. (A., N.F.).
Macrorchis meditata Fln. (N.F.).
Hoplogaster mollicula Fln. (Gen.).
38. *Spanochaeta dorsalis* v. Ros. (Faw., N.F.).
Coenosia distinguens Collin (N.F.).
,, *geniculata* Fln. (A., St., N.F.).
,, *lineatipes* Ztt. (Ch., Har., F.).
,, *tricolor* var. *nigridigita* Rdi. (Par.Wd.).
,, *salinarum* Stein (A., Heng.).
,, *tigrina* F. (Gen.).

CORDYLURIDAE.

Amaurosoma inermis Beck. (N.F.).
Trichopalpus punctipes Mg. (Heng.).
Spathiophora hydromyzina Fln. (Heng.).
Scatophaga scybalaria L. (N.F.).

COELOPIDAE.

Fucomyia parvula Hal. (Heng.).
Malacomyia sciomyzina Hal. (Heng.).

SCIOMYZIDAE.

Sciomyza cinerella Fln. (F.).
,, *griseola* Fln. (Hur.).
Tetanocera elata F. (F., St.).

SAPROMYZIDAE.

Sapromyza albiceps Fln. (F., B.Wd.).
,, *lupulina* F. (Ch.).
,, *trispina* Rdi. (F.).
39. ,, *quadrinotata* Ztt. (N.F., B.Wd.).
Sapromyza quadrivittata Lw. (B.Wd.).
Lauxania amica Hal. (N.F.).
,, *cylindricornis* F. (F., N.F.).
Peplomyza wiedemanni Lw. (N.F.).

LONCHAEIDAE.

Lonchaea chorea F. (N.F.).
,, *viridiana* Mg. (F.).

ORTALIDAE.

Dorycera graminum F. (F.).
Melieria picta Mg. (Heng.).
Ptilonota guttata Mg. (F.).
Herina nigrina Mg. (F.).
,, *palustris* Mg. (Faw.).
Ulidia erythrophthalma Mg. (F.).

TRYPETIDAE.

Carphotricha guttularis Mg. (F.).
Ensina sonchi L. (Heng.).
Tephritis ruralis Lw. (F., N.F.).
,, *vespertina* Lw. (Ch., F.).
Oxyna tessellata Lw. (Heng.).
Enaresta conjuncta Lw. (Ch., Hur., N.F.).
Urellia eluta Mg. (Heng.).
,, *stellata* Fues. (Heng.).

SEPSIDAE.

Henicita annulipes Mg. (Heng.).
Themira putris L. (F.).

PSILIDAE.

Loxocera albiseta Schrnk. (Faw., N.F.).
Chyliza vittata Mg. (Faw.).
40. *Psila obscuritarsis* Lw. (F.).

CHLOROPIDAE.

Melanum laterale Hal. (Heng.).

EPHYDRIDAE.

Notiphila cinerea Fln. (R.).
,, *riparia* Mg. (R.).
Discocerina pulicaria Hal. (N.F.).
Hydrellia porphyrops Hal. (N.F.).
Ochthera mantis Deg. (St., N.F.).
Parhydra litoralis Mg. (N.F.).
,, *obliqua* Beck. (N.F.).
,, *quadripunctata* Mg. (N.F.).

The generic names and their arrangement are mainly as used by various British workers as follows: — For the first eight families, the Syrphidae, and Pipunculidae (Verrall, 1901, *British Flies,* **8**); Empididae (Collin, 1926-27, *Ent. Mon. Mag.,* **62-63**); Dolichopodidae (Verrall, 1904-05, *Ent. Mon. Mag.,* **40-41**); Tachinidae (Wainwright, 1928, *Trans. Ent. Soc. Lond.,* **76**: 139-254); the last eleven families (Verrall, 1901, A List of Brit. Dipt., 2nd Ed., and Collin, 1910-11, *Ent. Mon. Mag.,* **46-47**). There is no British author who can be followed for the Anthomyidae, and many changes have been made since the publication of Meade's Annotated List, and Verrall's List of British Diptera; as local lists are usually based upon names used by Verrall, we have given the synonymy where specific names used by this author have been changed, and notes showing under which genera in Verrall some species are to be found.

1. *Medeterus dendrobaenus* Kow. This species and *M. petrophilus* Kow. were incorrectly recognised by Verrall. All his *M. dendrobaenus* (except one male from Farnham in Surrey, 16.viii.06) were the true *petrophilus* of Kowarz, and his *M. petrophilus* a new species described by Abbé O. Parent in 1925 (*Ann. Soc. Sci. Bruxelles,* C.R., **44**: 553) as *M. petrophiloides.* This was known to one of us (Collin), who was therefore particularly pleased to find the true *dendrobaenus* in some numbers on the trunk of a fir tree close to Matley Passage (New Forest) in August, 1931, and again at end of July, 1932. An adaptation of Parent's Table of Species to that given by Verrall would be as follows :—

19 (22). Discal (fourth) vein ending *at* the apex of wing, last section of this vein equal to, or slightly longer than, penultimate section in at least the males.

20 (21). Last section of postical (fifth) vein longer than discal cross-vein. Male hypopygium rather slender, with side lamellae almost as long as basal part, and anal lamellae long and slender ..... *truncorum* Meig.

21 (20). This section shorter than cross-vein. Male hypopygium large, side lamellae not more than half length of basal part, and anal lamellae short and stout ..... *dendrobaenus* Kow.

22 (19). Discal vein ending below tip of wing, last section (at least in male) obviously shorter than penultimate section.

23 (24). Clypeus shining green on middle, widely dusted at sides. Face and front with yellowish-grey tomentum. Prothoracic bristles white. Front coxae with whitish-yellow hairs and bristles. Hypopygium large, more like that of *dendrobaenus* ..... *petrophilus* Kow.

24 (23). Clypeus violaceous-blue, almost entirely shining. Face and frons with a reddish-brown tomentum. Prothoracic bristles somewhat rusty-yellow. Front coxae with brownish-yellow hairs and bristles. Hypopygium slender, more like that of *truncorum* ..... *petrophiloides* Par. This last name is new to our British list.

2. *Pipunculus semifumosus* Kow. is a species distinct from, though closely allied to, *strobli* Verr. It is a rather larger species with the fourth abdominal tergite in the male almost all shining, whereas in *strobli* this tergite is extensively dulled about base. The female differs from that of *strobli* in having narrower wings not so bluntly rounded at end. We have seen specimens from Cambs., Suffolk, Essex, Oxfordshire and Herefordshire taken in July and August. This is new to the 'List' of British species.

3. *Leucostoma simplex* Fln. A single male of this species was swept up at Hurn on 4th August, 1932, by Mr. E. Rivenhall Goffe when collecting with us. Mr. Goffe, who was not using a sweeping net, made a casual sweep, not so much for himself, as with the friendly hope of providing material for one of us. In this case it was Collin who picked out the specimen as something interesting, and it is now in his collection. Though not included in 'British Tachinidae' (1928, *Trans. Ent. Soc. Lond.*, **76**: 139-254), except in a note in Appendix A, because at that time no British specimen was known to be in existence, the species cannot be regarded as new to us because Verrall included it in his List of British Diptera, 1901, under the genus *Psalida*, doubtless on the faith of old records by Walker and Meade. It should be an easy species to recognise, as its unusually large, domed, snowy-white, squamae alone are characteristic, and combined with the long stalk to the first posterior cell, the narrow, tapered, entirely shining black, abdomen, with only marginal macrochetae, short antennae with third segment barely longer than second, three postsutural dorsocentrals, and bare genae, provide a distinctive combination of characters. It belongs to a little group of Tachinidae sometimes grouped under the subfamily name Phaniinae, and in the female bears at the tip of abdomen a pair of organs having some resemblance to a pair of forceps, a character occurring only in the Phaniine species. In the 'Key' in 'British Tachinidae' it runs down to '54' where it can be compared with *Plesina*, from which it differs, not only through the large squamae, and long cell-stalk, but also by its entirely clear wings. It is a small insect and entirely black. Nothing seems to be known of its life-history or habits.

4. *Pseudomorellia*, previously listed under *Polietes*.

5. *Lyperosia*, previously listed under *Haematobia*.

6. *Muscina,* an older generic name for *Cyrtoneura.*

7. *Phaonia,* many species previously listed under *Hyetodesia* and *Spilogaster.*

8. *Hebecnema,* previously listed under *Hyetodesia* and *Mydaea.*

9. *Mydaea setifemur* Ringd. was described in 1924 (*Ent. Tidskr.,* **45**: 42) as a variety of *M. tincta* Ztt., from which it may be distinguished by the presence of a postero-ventral row of bristles to the hind femora in the male becoming shorter towards base of femur, the female also has bristly hairs postero-ventrally on these femora, though not so conspicuous as in the male. We have seen specimens from Kent, Sussex, Surrey and Herefordshire, in addition to Hampshire. It has not previously been recorded as British.

10. *Helina,* many species previously listed under *Spilogaster* and *Mydaea.*

11. *Helina cilipes* Schnbl. A species remarkably like *H. anceps,* but with quite different male genitalia (figured by Schnabl and Dzidzicki in 1911). It has only three pairs of postsutural dorsocentrals, whereas *anceps* more normally has four, while the bristle at middle of front tibia and those above hind tibia are distinctly longer than in *anceps.* The female is at present unrecognised. This species was unknown to us until captured on the sandhills at Studland in August, 1930. A few more specimens were obtained at the same spot in August, 1931.

12. *Enoplopteryx,* previously listed under *Spilogaster.*

13. *Lasiops,* previously listed under *Hyetodesia.*

14. *Lophosceles,* previously listed under *Trichopticus.*

15. *Limnophora v.* Collin (1921, *Ent. Mon. Mag.,* **57**).

16. *Fannia,* an older name for *Homalomyia.* For British species *v.* Malloch, *Scottish Naturalist,* **1912.**

17. *Acroptena,* previously listed under *Hydrophoria.*

18. *Hylemyia variabilis* Stein. Remarkably like *H. variata,* differing only in having the eyes in male less closely approximated on front and in the genitalia; these latter in *variabilis* have shorter mesolobe and paralobes (side lamellae), the paralobes being club-shaped, whereas in *variata* they are slender, more pointed and very much longer. It appears to be a common and widely distributed species of which we have records from various localities in England and Scotland, but has not, we believe, been recorded as British.

19. *Hylemyza* and **20.** *Melinia,* previously listed under *Hylemyia.*

21. *Acrostilpna,* previously listed under *Chortophila.*

22. *Pycnoglossa* and **23.** *Pegoplata,* previously listed under *Hylemyia.*

24. *Pegomyia.* Some species previously listed under *Hydrophoria* and *Phorbia.*

25. *Pegohylemyia.* Some species previously listed under *Hylemyia* and *Phorbia.*

26. *Pegohylemyia sonchi* Hardy has not been recognised since it was described by Hardy in 1872 (*Scot. Nat.,* **1**: 209). It is obviously allied to *gnava* Mg. and *seneciella* Mde., but is a greyer insect than the former with a narrower dark median stripe on abdomen than either, and distinct male genitalia. It was obtained by us in August, 1931, both at Studland and Hengistbury Head by sweeping over the flowers of *Sonchus arvensis,* and further specimens were obtained at Hengistbury Head in August, 1932. We think that *Chortophila lineata* Stein (1914) may be a synonym.

27. *Phorbia grisea* Ringd. Easily recognised by its grey colour and the presence of a postero-ventral as well as an antero-ventral spur to hind tibiae. It may be identical with *Chortophila nuceicornis* Pand. We have taken it at Chippenham Fen (Cambs) and Crowborough (Sussex), while Mr. C. A. Cheetham has found it in Yorkshire.

P. genitalis was in Verrall's 'List' as *Chortophila sepia.*

28. *Calythea,* previously listed under *Anthomyia.*

29. *Opsolasia,* previously listed under *Lasiops.*

30. *Paregle,* previously listed under *Anthomyia* and *Chortophila.*

31. *Nupedia,* previously listed under *Anthomyia* and *Phorbia.*

32. *Delia,* previously listed under *Hylemyia* and *Phorbia.*

33. *Delia carduiformis* Schnbl. belongs to the typical *Delia* group, having in the male many long bristly hairs on third abdominal sternite; the male has no antero-dorsal bristle to middle tibia, and no swelling at base of second segment of middle tarsi beneath. It is the *Hylemyia cardui* of Meade but not of Meigen, and is not uncommon.

34. *Delia nuda* Strobl belongs to the same group as *carduiformis*; in the male the third abdominal sternite bears numerous but shorter hairs, the middle tibiae have an antero-dorsal bristle, the second segment of middle tarsi is swollen at base beneath, and the prealar bristle comparatively short. It is the *Hylemyia antiqua* of Meade (according to specimens received from him) but not of Meigen. It is also not uncommon.

35. *Delia pilipyga* Vilien. is allied to *D. brassicae* Bouché, the type of Lioy's genus *Erioischia,* having in common with that species the costa of wing hairy beneath. The male is easily recognised by the very long bristly hairs on lobes of fifth abdominal sternite. It has a wide distribution in Britain and has been bred by one of us (Collin) from larvae attacking the roots of radishes.

36. *Hammomyia* and *Hylephila, v.* Collin, 1921, *Trans. Ent. Soc. Lond.,* **1920**: 305-326.

37. *Lispocephala,* previously listed under *Coenosia* and *Caricea.* Also *v.* Verrall, 1911, *Ent. Mon. Mag.,* **47**: 79.

38. *Spanochaeta,* listed under *Coenosia, v.* Verrall as above.

39. *Sapromyza quadrinotata* Ztt. This belongs to the group with round dark spots on abdomen (in this case two pairs); it is a small yellow species (2-2.5 mm.) with only microscopically pubescent arista, yellow palpi, thorax slightly dulled by dust and having acrostichals in four rows. It is a northern insect which we have previously known from Scotland only (Aviemore and Lochinver). Its occurrence in Bentley Wood and in Mark Ash, New Forest, at Whitsun, 1933, is therefore particularly interesting. It has not previously been recorded as British.

40. *Psila obscuritarsis* Lw. A rather large (though smaller than *fimetaria*), yellow species, easily recognised among British species in having only one pair of dorsocentral bristles on thorax, but four scutellar bristles. This species has been taken by one of us at Chippenham Fen (Cambs), Barton Mills (Suffolk) and Oxford and received from Musselburgh (Scotland), but the locality in Hampshire (Farley Downs), where it was found at Whitsun, 1933, is of a very different type. It is an addition to our British List.

J. E. Collin and C. J. Wainwright.

SOCIETY FOR BRITISH ENTOMOLOGY

List of Publications for Sale at the Nett Prices shewn.

(All prices are post free.)

SYSTEMATIC WORKS.

BRITISH HEMIPTERA-HETEROPTERA. By Hugh P. Jones, F.R.E.S. 1930. 88 pp. with 2 Plates. Price 5*s.* 6*d.*

BRITISH NEUROPTERA. By F. J. Killington, B.Sc., A.L.S., F.R.E.S., etc. 1929. 36 pp., 6 Plates, 6 Text figs. Price 5*s.* 0*d.*

BRITISH TABANIDAE (Diptera). By E. Rivenhall Goffe. 1930. 71 pp., 2 Plates. Price 5*s.* 0*d.*

BRITISH TIPULINAE (Diptera). By H. L. F. Audcent. 1932. 35 pp., 3 Plates. Price 4*s.* 0*d.*

KEYS TO BRITISH ASILIDAE (Diptera). By B. M. Hobby, M.A., D.Phil., F.R.E.S. 1932. 6 pp. Price 1*s.* 9*d.*

MEIGEN'S 'NOUV. CLASS.' 1800. By E. Rivenhall Goffe. 1932. 7 pp. Price 1*s.* 0*d.*

FAUNAL LISTS.

TORTRICES OF HANTS AND I.O.W. By W. Fassnidge, M.A., F.R.E.S. 1929. 20 pp. Price 2*s.* 6*d.*

MACRO-LEPIDOPTERA OF HANTS AND I.O.W. By W. Fassnidge, M.A., F.R.E.S. 1925. 42 pp. Price 2*s.* 6*d.*

HYMENOPTERA ACULEATA OF HANTS AND I.O.W. By Hugh P. Jones, F.R.E.S. 1926. 13 pp. Price 1*s.* 0*d.* With Supplement, 1932, 1*s.* 6*d.*

PARANEUROPTERA OF HANTS AND I.O.W. By F. J. Killington, B.Sc., A.L.S., F.R.E.S., etc. 1926. 9 pp. Price 1*s.* 0*d.*

LIST OF BRITISH COLLEMBOLA. By F. A. Turk, F.Z.S., F.R.E.S. 1933. 6 *pp.* Price 1*s.* 0*d.*

Other Faunal Lists no longer available as separates will be found in the Transactions and Journal.

GENERAL WORKS.

'ENTOMOLOGY AND ETHICS.' By W. Fassnidge, M.A., F.R.E.S. (Presidential Address, 1931). 1932. 16 pp. Price 1*s.* 0*d.*

BIBLIOGRAPHY OF ENTOM. NOTES IN PUBLICATIONS OF BRITISH LOCAL SOCIETIES. Part I. Price 2*s.* 6*d.* (An indispensable Supplement to the Zoological Record.)

SERIAL PUBLICATIONS (Ent. Soc. S. Engl.).

THE JOURNAL.

VOL. I, PART I. April, 1932. Price 2*s.* 6*d.*

VOL. I, PART II. November, 1932. Price 2*s.* 6*d.*

VOL. I, PART III. May, 1933. Price 2*s.* 6*d.*

VOL. I, PART IV. December, 1933. Price 2*s.* 6*d.*

TRANSACTIONS, VOLS. I — IV, were issued by the Entomological Society of Hampshire, and are out of print. Copies occasionally become available, however, and those desiring to be informed of such should register their names with the Hon. Secretary.

The subscription to the Society, which includes copies of all matter published during the period covered, is 21*s.* 0*d.* per annum.

THE TRANSACTIONS.

VOL. V. 1929. 100 pp. 7 Plates. Price 7*s.* 6*d.*

VOL. VI. 1930. 150 pp. 2 Plates. Price 10*s.* 6*d.*

VOL. VII. 1931. Part I. 55 pp. Price 7*s.* 0*d.*

VOL. VII. 1931. Part II. 86 pp. Price 10*s.* 6*d.*

VOL. VIII. 1932. Part I. 64 pp. 5 Plates. 2 Text figs. Price 8*s.* 0*d.*

VOL. VIII. 1933. Part II. 76 pp. Price 7*s.* 0*d.*

The List of Contents of any Volume will be sent on request.

Orders, accompanied by the appropriate remittance, should be addressed to **E. Rivenhall Goffe,** Hon. Sec., 102 High Street, **Southampton.**

565
Insect

VOL. 1. PART 2.

JOURNAL
OF THE
SOCIETY FOR BRITISH ENTOMOLOGY

(Formerly known as The Entomological Society of the South of England)

EDITOR:
F. J. KILLINGTON, B.Sc., A.L.S., F.R.E.S.

ASSISTANT EDITOR:
B. M. HOBBY, M.A., D.PHIL., F.R.E.S.

DATE OF PUBLICATION: 3rd OCTOBER, 1934.

Copies may be purchased from the Secretary at 102, High Street, Southampton.

Price 2s 6d., post free.

CONTENTS.

PAGE

AUDCENT, H.: *Medetera petrophiloides* Par. (Dipt., Dolichopodidae) in Somerset 40

———— *Dorilas* (*Pipunculus*) *semifumosus* Kow (Dipt., Dorilaidae) in Somerset 41

BURROWS, W. F.: Attempted pairing by two males of *Pieris rapae* Linn. with a female *Gonepteryx rhamni* Linn. (Lep.) 40

———— *Macroglossa stellatarum* Linn. (Lep.), immigrants at Lulworth Cove, Dorset, in 1934 ... 40

COE, R. L.: *Eristalis abusivus* Collin (Dipt., Syrphidae) in Cornwall 40

CURTIS, W. P., F.R.E.S.: *Melitaea aurinia* Rott. (Lep.): flying powers 29

———— Behaviour of males of *Lysandra coridon* Poda towards a female ab. *syngrapha* Kef. (Lep.) 30

———— *Tephrosia bistortata* Goëze (Lep.): return to resting place 30

EAST, K.: *Acherontia atropos* Linn. (Lep., Sphingidae) in the I. of Wight 39

EDWARDS, F. W., M.A., Sc.D., F.R.E.S.: *Microsania pectinipennis* Mg. (Dipt., Platypezidae) attracted to bonfire-smoke 31

———— Some further records of 'Smoke-flies' (Dipt., Platypezidae) 32

———— Diptera on Grassholm Island, Pembrokeshire 33

———— *Aldrovandiella winthemi* Duda in Scotland: a Scatopsid (Dipt.) new to the British Isles 34

FASSNIDGE, W. F., M.A., F.R.E.S.: *Euzophera pinguis* Haw. (Lep., Phycitidae) in abundance at Southampton 41

———— *Eucosma turbidana* Tr. (Lep., Tortricina) in Hants 41

———— *Auximobasis normalis* Meyr. (Lep., Tineina) in Hants 41

———— *Cateremna terebrella* Zinck. (Lep., Phycitidae) in Hants 41

———— *Laspeyresia strobilella* L. (Lep., Tortricina) in Hants 42

[*Continued on page 3 of cover.*

JOURNAL OF THE SOCIETY FOR BRITISH ENTOMOLOGY

VOL. 1. 3rd OCTOBER, 1934 PART 2.

Ecphoropsis vexans Hlmgr.: an Ichneumonid (Hym.) new to Britain.

Two males and a female of this species were bred in May, 1932, from larvae of *Acosmetia caliginosa* Hb. collected in South Hants in August, 1932. At present not more than one parasite has been bred from each host. The Ichneumonid emerges from its host just as the latter is full-fed, but before it has time to make its earthen cocoon. The cocoon of *E. vexans* is round in shape, similar to that of *Spudastica kriechbaumeri* Bridg., but less strongly banded.

As arranged by C. Morley (1914, *The Ichneumons of Great Britain,* **5**: 141) the genus *Ecphoropsis* Ashmead follows *Spudastica* Thoms. Species of the genus *Spudastica* exhibit a jumping habit as cocoons, but my cocoons of *E. vexans* were not observed to jump, although they were kept warm for periods of two or three days at a time.

It has been suggested that an Ichneumonid bred by Dr. E. A. Cockayne (1933, *Entomologist,* **66**: 38) from *A. caliginosa* and determined as a species of the genus *Callidera* may be referable to *E. vexans,* but I do not know if they have been compared.

I am much indebted to the authorities of the British Museum (Natural History) for the trouble taken with this species. A male and female have been presented to the National Collection.

A. H. SPERRING.

Melitaea aurinia Rott. (Lep.): flying powers.

Two specimens of *M. aurinia* were taken in a locality near Portsmouth in May, 1934. The spot lies in the middle of an area which has been re-afforested and is a strict pheasant preserve. I have worked the locality for some years, but this is the first time I have encountered this species there, and I do not think that it is possible that I could have overlooked it. I know of no locality within miles of this particular spot in which *M. aurinia* occurs.

A. H. SPERRING.

Melitaea aurinia Rott. (Lep.): flying powers.

The following records refer to specimens of *M. aurinia* that have been seen or captured by Mr. H. Symes, and that were, in his opinion, wanderers. They supplement the records collected by me in the *Entomologist,* **65**: 74 (1932).

Charney Bassett, about five miles east of Faringdon, Berks. One female captured and released on 31st May, 1934. There used to be a colony at Cothill, seven miles north-east, but it has steadily dwindled of recent years, and Mr. Symes has not heard of or seen any *aurinia* there during the past two years.

Newbury, Berks. Mr. Symes saw a female taken four miles north-east of Newbury on 9th June, 1934. The locality is full of *Scabiosa succisa* L., but although it has been fairly well worked this year, this is the only specimen seen.

Stanton St. John, about six miles north-east of Oxford. Mr. Symes has worked this locality for the past five years and has seen only one isolated specimen there prior to 10th June, 1934, when another was taken. W. Parkinson Curtis.

Behaviour of males of Lysandra coridon Poda towards a female ab. syngrapha Kef. (Lep.).

At Wootton-under-Edge, in Gloucester, I had an opportunity of watching a female *Lysandra coridon* Poda, ab. *syngrapha* Kef., for some little time before I took it.

The particular colony of which it was a member occupies a very steep bank about thirty feet high, which is luxuriantly covered with *Lotus, Odonestis, Hippocrepis,* etc. It has a marked tendency to vary in the direction of obsolescence and also a slight tendency to produce females with blue scaling.

I saw the *syngrapha* below me, say fifteen feet down on the bank, flying in a leisurely style at 10.30 a.m. G.M.T., and at a time when many dozens of males were looking for the females. The *syngrapha* was quite fresh. The males were paying assiduous court to any female garbed in the customary brown, but although this female *syngrapha* repeatedly endeavoured to dally with a male, the males, after a casual gambol much in the same combatative way in which they gambol with another male, passed on without showing any sexual reaction. I watched the female for about ten minutes and then my desire to possess a specimen of this form captured by myself got the better of my curiosity and I netted her.

From all I can gather this form is scarcer than it was a generation ago. The apparent indifference of the males may be one of the reasons. W. Parkinson Curtis.

Tephrosia bistortata Goëze (Lep.): return to resting place.

On 2nd May, 1934, I observed a specimen of this insect at rest upon the trunk of a horse-chestnut in Meyrick Park, Bournemouth. On 3rd May, 1934, the same insect was at rest on the same tree, within six inches of its former resting-place. On 4th May, 1934, the insect was absent, nor was it to be found on any neighbouring tree W. Parkinson Curtis.

Microsania pectinipennis Mg. (Dipt., Platypezidae) attracted to bonfire-smoke.

The small black flies of the genus *Microsania* were formerly supposed to be of great rarity, but it has been known since 1921 that they may sometimes be found in abundance in the neighbourhood of heath fires, several such occurrences having been reported in Belgium. Until recently no species of the genus was known to occur in Britain, but in 1926 I took a specimen of *M. pectinipennis* Mg. on a fowl-house window at Welwyn, Herts, and in 1933 Mr. J. E. Collin took examples of this species and of *M. pallipes* Mg. on the Norfolk coast; he has published some notes on the genus in 1933, *Proc. Ent. Soc. Lond.*, **8**: 146.

On 21st July, 1934, I happened to be standing with friends near a smouldering bonfire at Welwyn, and my attention was called to a swarm of small Diptera flying in the smoke. On examination they all proved to be *Microsania pectinipennis*, and Dr. B. M. Hobby and I secured a large number. Mr. P. H. Hewlett informed us that he had frequently seen swarms of similar small flies when attending to bonfires in this locality, as well as when beating out fires started in the herbage by passing trains; in the latter occupation the flies caused annoyance to the beaters by dancing in front of their faces.

On 24th July I visited the locality again, hoping to obtain further females of *M. pectinipennis*, the first batch of three hundred or more specimens having included only a single example of this sex. On this occasion the fire was not burning, and though I spent half an hour in searching amongst the remains of the old fire and in the immediate vicinity, I could not find a single *Microsania*. Mr. Hewlett, however, assured me that if we started a fire the flies would arrive within five minutes. Accordingly, we made a smudge with a handful of hay and some garden refuse, and seven minutes after striking the match saw the first *Microsania*; five minutes later they were present in hundreds. A fair number of females was obtained by sweeping low over the smouldering embers, where some of the flies were seen to settle; evidently the females do not fly so high as the males, and unless the net is used close to the ground they are apt to be overlooked. The apparent scarcity of females of this genus in Belgium, commented upon by Mons. A. Collart (1933, *Bull. Mus. Roy. Hist. Nat. Belg.*, **9** (40): 1-17), is doubtless due merely to the method of collecting.

The *Microsania* appeared to be unusually resistant to the fumes of cyanide: each of three specimens timed remained active in the killing-bottle for from forty to fifty seconds, whereas a *Drosophila* and a Chloropid of about the same size were motionless after ten seconds and a *Sepsis* (a larger, harder fly) after twenty seconds. This observation suggests that *Microsania* is

definitely adapted to resist noxious fumes or oxygen deficiency, and may perhaps afford a clue to the discovery of its life-history, which is at present unknown.

A further clue to the life-history of *Microsania* may be provided by the mites with which the flies are often heavily infested—as many as fourteen mites were found on a single fly. Dr. S. Finnegan, who has examined a number of these, states that they are protonymphs and deuteronymphs of a species of *Parasitus,* a large genus of terrestrial mites, many of which are found in the adult stage on fungi, where they prey upon other Acarines.

M. pectinipennis varies in size to a rather remarkable extent: the largest specimen seen (a male) had a wing-length of 2·4 mm. and a body-length of 3 mm.; the smallest (a female) a wing and body-length of 1·2 mm. F. W. Edwards.

Some further records of 'Smoke-flies' (Dipt., Platypezidae).

In *The Times* of 24th August, 1934, Mr. V. W. Alexander reported his observation of scores of martins flying in the smoke of burning oats rakings at Braintree (Essex). I wrote suggesting that the birds were feeding upon *Microsania,* and invited readers of *The Times* to send me observations upon smoke-flies. The following extracts from letters received almost certainly refer to *Microsania* and are interesting in connection with the above records:—

Surrey (Farnham):—'On at least two occasions during August, 1934, I observed small swarms of flies that were attracted to the smoke of bonfires, enjoying the thickest part of the smoke. The bonfires were burning in the shade under pine trees on hot dry days.'—Lt.-Col. T. R. Bacon.

Surrey (Woldingham):—'In the early part of July old pasture land was being prepared for lawn making, turf, etc., being burnt in small bonfires. All round every fire, and only in the smoke, hundreds of tiny flies appeared. One was not aware of them until one was actually in the smoke, when they appeared to be hovering close to the face.'—Brenda Colvin.

Surrey (Hook Heath, Woking):—'Five or six years ago when clearing ground for a garden . . . almost immediately a fire was lighted there would spring up swarms of little black flies which seemed to enjoy flying in the smoke. They were thick round one's head.'—Dr. B. W. Gowring.

Surrey (Godalming):—'I have noticed the same thing this summer, but not to the same extent as at Hook Heath.'—Dr. B. W. Gowring.

Kent (Orpington) :—'This year, for the first time as far as my observation goes, every garden rubbish fire has attracted swarms of small flies. I have noticed them only when there has been a good volume of smoke, and they obviously follow the clouds and keep in it.'—C. O. Rideny.

Herts (Aldenham, Watford) :—'I have often seen the flies dancing in the smoke of a bonfire composed of garden weeds, hay, etc. The fire has been lit on the ashes of a previous one of like nature, before the ashes are cold, and immediately on the smoke rising the flies have been in evidence.'—E. B. Burnet Harris.

Berks (Bucklebury Common, Reading) :—'We have noticed the same black flies whenever we have had a bonfire this year.' —Mrs. G. M. Brodwith.

Dorset (Hays Sedgehill, Shaftesbury) :—'During the hot weather last year when burning old stumps of oak and ash trees out in the park I noticed some small black flies flying round my head and bothering me; so I got further into the smoke with the idea of driving them away, the only result being that they increased. I then noticed they preferred to be *in* the smoke. I noticed them on several occasions, but though often burning rubbish, loppings, etc., never in any other place. They did not settle on my face, but danced a few inches away: a few paces up wind, and they retired to the smoke.'—Col. G. V. Brownlow.

Brecknock (Llanwrtyd Wells) :—'On the little golf course here I saw a patch of peat burning, so I went to it on the chance of seeing some of these flies. There were quite a number flying about in the smoke and I caught one, which I enclose in an envelope.'—H. R. Nias.

The specimen sent by Mr. Nias was a male *Microsania pectinipennis* Mg. F. W. Edwards.

Diptera on Grassholm Island, Pembrokeshire.

Grassholm is a small rocky islet, about twenty acres in extent, situated about eight miles off the Pembrokeshire coast. About one-third of the island is occupied by a large colony of gannets, and the rest is mostly covered with rough rank grass, with very few flowers (no thrift, bracken or gorse). Prof. Julian Huxley and Mr. R. M. Lockley of Skokholm visited the island in June, 1934, for the purpose of studying the birds, and while there collected some insects which he submitted to the British Museum for determination. On 27th August, 1934, I paid a brief visit to the island in company with Mr. and Mrs. Lockley, and was able to spend half an hour in sweeping for insects. I also examined the gannets' nests, but found practically nothing in them.

The following is a list of the Diptera collected by Prof. Huxley, Mr. Lockley (*) and myself (†). I am indebted to Mr. J. E. Collin for assistance in the determination of many of the Cyclorrhapha:—

SCIARINAE.

†*Sciara autumnalis* Winn.
†*Sciara nitidicollis* Mg.
†*Sciara vivida* Winn.
Sciara sp., ♀ (? *fenestralis* Mg.).

SCATOPSIDAE.

*†*Scatopse notata* L.

CHIRONOMIDAE.

†*Cricotopus vitripennis* Mg.

DOLICHOPODIDAE.

†*Dolichopus plumipes* Scop.
*†*Medeterus dendrobaenus* Kow.
†*Medeterus petrophilus* Kow.
†*Aphrosylus ferox* Walk.

LONCHOPTERIDAE.

**Lonchoptera* sp., ♀.

PHORIDAE.

†*Megaselia rufipes* Mg.
†*Megaselia pleuralis* Wood.

SYRPHIDAE.

†*Syrphus corollae* F.

CALYPTRATA.

†*Calliphora erythrocephala* Mg.
†*Lucilia sericata* Mg.
†*Mydaea duplicata* Mg.
†*Fannia canicularis* L.
*†*Anthomyia pluvialis* L.

ACALYPTRATA.

†*Scatophaga stercoraria* L.
†*Leptocera heteroneura* Hal.
*†*Themira putris* L.
†*Sepsis cynipsea* L.
†*Sepsis orthocnemis* Frey.
†*Opomyza germinationis* L.
†*Oscinis nitidissima* Mg.
†*Oscinis frit* L.
†*Oscinis frit* L., var. *vastator* Purt.
†*Scatella stagnalis* Fln.
†*Scatella tenuicosta* Collin.
†*Scatophila caviceps* Sten.
†*Scaptomyza graminum* Fln.
†*Scaptomyza incana* Mg.
*†*Meoneura* sp.n.
†*Dizygomyza luteiceps* Hend.
†*Phytomyza nigra* Mg.
†*Cerodonta denticornis* Panz.

The most abundant flies were the species of *Medeterus, Lucilia, Fannia, Themira, Oscinis* and *Meoneura,* all of which were present in large numbers. Mr. Collin states that *D. luteiceps* Hend. is an addition to the British list, but that he has one female of this species from Chillesford Decoy (Suffolk).

F. W. EDWARDS.

Aldrovandiella winthemi Duda in Scotland: a Scatopsid (Dipt.) new to the British Isles.

In introducing recently a new British species of the genus *Aldrovandiella* (1934, *Ent. Mon. Mag.,* **70**: 140) I remarked that the other European species, *A. winthemi* Duda, was unknown to me. Such ignorance was unnecessary, for I now find that Mr. R. L. Coe took a pair of *A. winthemi* by Loch Pityoulish, Inverness-shire, on 3rd July, 1933; Mr. Coe informs me that

the specimens were taken under stones in a meadow. We therefore have all the four known European species of *Aldrovandiella* in these islands. *A. winthemi* differs strikingly from *A. halterata* Mg. (and from *A. verralli* Edw.) in genitalia, but, like Duda, I have been unable to discover any other constant distinction.

F. W. Edwards.

Prey of Aeshna cyanea Müll. (Odon.).

A male *Aeshna cyanea* and its Tachinid prey, *Calliphora* sp. indet., were taken at New Milton, Hants, during September, 1932, by Mrs. A. J. Sturmey. The specimens have now been placed in the Hope Department, University Museum, Oxford.

J. R. Freeman.

Predacious Diptera and their Prey.

This communication comprises thirty-eight records of the prey of Asilidae, Coenosiinae and Cordyluridae; with but one exception these are new and hitherto unpublished. For completeness a few continental observations have been included, but all deal with predatory species occurring in Britain.

I desire to acknowledge my indebtedness and to express my sincere thanks to the following entomologists for their kind help:—

To Drs. K. G. Blair and O. W. Richards, Messrs. H. W. Andrews, V. Bruce-Mitford, R. L. Coe, J. Collins, H. Donisthorpe, W. Fassnidge, A. H. Hamm, P. Harwood, A. Thornley and G. C. Varley, who not only sent me specimens for study, but also allowed them to be retained for preservation in the bionomic collections of the Hope Department, Oxford University Museum.

To Drs. F. W. Edwards and C. Ferrière and Messrs. R. B. Benson, J. E. Collin and A. Thornley for assistance in identification of the prey.

To Dr. W. J. Fordham for directing my attention to several references dealing with the feeding-habits of Asilidae.

ASILIDAE.

Prey of Leptogaster cylindrica De G.

DIPTERA.

Anisopidae.

1. ♂. **Anisopus punctatus* F., ♂, Water Eaton, Oxon, 20.vi.28.—J. Collins.

* Not previously recorded as prey of this species.

Prey of Isopogon brevirostris Mg.

DIPTERA.

Anthomyiidae.

2. ♂. **Fannia aërea* Mg., ♀, Aviemore, Inverness-shire, 27.vi.33.—B. M. Hobby.

Oscinidae.

3. —. **Chlorops speciosa* Mg., ♀, var. without yellow stripes on thorax, Aviemore, Inverness-shire, 27.vi.33.—B. M. Hobby.

HYMENOPTERA.

Ichneumonidae.

4. ♂. **Hemiteles* sp. indet., ♂, Aviemore, Inverness-shire, 27.vi.33.—B. M. Hobby.

Prey of Lasiopogon cinctus F.

DIPTERA.

Anthomyiidae.

5. ♂. **Musca autumnalis* De G., ♂, Bagshot, Surrey, 8.vi.34.—O. W. Richards.

Asilidae.

6. ♀. **Lasiopogon cinctus* F., ♀, Bagshot, Surrey, 4.vi.34.—O. W. Richards.

Rhagionidae.

7. ♀. **Symphoromyia crassicornis* Pz., ♀, Galtür, Paznauntal, Austria, 25.vii.33.—O. W. Richards.

Prey of Dioctria rufipes De G.

DIPTERA.

Sapromyzidae.

8. ♀. **Sapromyza* sp. ? *subvittata* Loew, Windsor Forest, Berks, 12.vi.34.—H. Donisthorpe.

HYMENOPTERA.

Tenthredinidae.

9. ♀. **Selandria cinereipes* Kl., ♀, Wood Eaton, Oxon, 10.vi.34.—V. Bruce-Mitford.

Prey of Laphria flava L.

COLEOPTERA.

Cerambycidae.

10. ♂. **Callidium violaceum* L., Galtür, Paznauntal, Austria, 28.vii.33.—O. W. Richards.

*Not previously recorded as prey of this species.

COCCINELLIDAE.

11. ♀. *Coccinella septempunctata* L., Loch Alvie, Inverness-shire, 25.vi.33.—B. M. Hobby.

12. ♀. **Mysia oblongoguttata* L., Aviemore, Inverness-shire, 25.vi.33.—B. M. Hobby.

ELATERIDAE.

13. ♂. **Dolopius marginatus* L., Loch Morlich, Inverness-shire, 24.vi.33.—B. M. Hobby.

14. ♀. **Corymbites impressus* F., Aviemore, Inverness-shire, 12.vii.34.—P. Harwood.

DIPTERA.

ANTHOMYIIDAE.

15. ♂. **Hydrotaea irritans* Fall., ♂, Loch Garten, Inverness-shire, 21.vi.33.—B. M. Hobby.

TACHINIDAE.

16. ♀. **Micropalpus haemorrhoidalis* Fall., ♂, Aviemore, Inverness-shire, 14.vii.34.—P. Harwood.

HYMENOPTERA.

TENTHREDINIDAE.

17. ♂. **Selandria morio* F., Aviemore, Inverness-shire, 25.vi.33.—B. M. Hobby.

PREY OF LAPHRIA MARGINATA L.

COLEOPTERA.

CURCULIONIDAE.

18. ♂. **Magdalis ruficornis* L., Hell Coppice, near Stanton St. John, Bucks, 1.vii.34.—B. M. Hobby.

PREY OF DYSMACHUS TRIGONUS MG.

HYMENOPTERA.

ANDRENIDAE.

19. ♀. **Andrena* sp. indet., ♀, St. Maximin, Var, France, 11.v.06.—T. A. Chapman.

PREY OF MACHIMUS RUSTICUS MG.

LEPIDOPTERA.

HESPERIIDAE.

20. ♀. **Ochlodes venata septentrionalis* Verity, ♂, Osborne, Isle of Wight.—G. Nobbs.

PREY OF NEOITAMUS CYANURUS LW.

DIPTERA.

ANTHOMYIIDAE.

21. ♀. *?*Delia* sp. indet., ♀, Bexley, Kent, 11.vi.27.—H. W.

* Not previously recorded as prey of this species.

Andrews (*cf.* 1929, *Proc. Ent. Soc. Lond.*, **4**: 23, and 1931, *Trans. Ent. Soc. S. Eng.*, **1930** (6): 41, where the prey is undetermined).

LEPIDOPTERA.

TORTRICIDAE.

22. ♀. *Tortrix viridana* L., ♀, Tubney, Berks, 1.vii.34.—H. Donisthorpe.

ANTHOMYIIDAE: COENOSIINAE.

PREY OF COENOSIA TIGRINA F.

DIPTERA.

ANTHOMYIIDAE.

23. ♀. **Delia brassicae* Bouché, ♂, Entomological Field Station, Storeys Way, Cambs., 25.vii.33.—G. C. Varley.

24. ♀. *Delia* sp. indet., ♀, indoors, Southampton, Hants, 17.v.33.—W. Fassnidge.

25. ♀. **Hydrotaea parva* Meade, ♂, Ansty Hall, Cambridge, 16.vi.33.—G. C. Varley.

BIBIONIDAE.

26. ♀. *Dilophus febrilis* L., ♂, Quy Fen, Cambs., 20.viii.33.—G. C. Varley.

DOLICHOPODIDAE.

27. ♀. **Dolichopus trivialis* Hal., ♀, on oak trunk, Water Eaton, Oxon, 18.vi.24.—J. Collins.

OSCINIDAE.

28. ♀. **Chloropisca glabra* Mg., ♀, Cambridge, 24.vi.33.—G. C. Varley.

SPHAEROCERIDAE.

29. ♀. *Leptocera* (=*Limosina*) *humida* Hal., ♂, Hogley Bog, Oxford, 28.vi.32.—A. H. Hamm.

TRICHOPTERA.

HYDROPTILIDAE.

30. ♀. **?Agraylea* sp. indet., ♂, Tintagel, Cornwall, 3.vi.33.—A. Thornley.

CORDYLURIDAE.

PREY OF SCATOPHAGA STERCORARIA L.

DIPTERA.

AGROMYZIDAE.

31. ♂. **Cerodonta denticornis* Pz., ♀, Iffley, Oxon, 5.vi.33.—B. M. Hobby.

ANTHOMYIIDAE.

32. ♀. *Fannia* sp. ? *serena* Fall., ♂, Entomological Field

* Not previously recorded as prey of this species.

Station, Storeys Way, Cambridge, 4.viii.33.—G. C. Varley.

33. ♂. **Hydrotaea dentipes* F., ♀, Tintagel, Cornwall, 6.vi.33.—A. Thornley.

34. ♀. *Hydrotaea* sp.? *irritans* Fall., ♀, Oxford, 8.vii.23.—A. H. Hamm.

35. ♂. **Paregle aestiva* Mg., ♀, Carbis Bay, Cornwall, 25.vi.33.—A. Thornley.

36. ♀. **Prosalpia billbergi* Zett., ♂, Tubney, Berks, 4.v.24.—J. Collins.

SEPSIDAE.

37. ♂. *Sepsis cynipsea* L., ♀, Blackwater, Hants, 4.vi.34.—R. L. Coe.

TACHINIDAE.

38. ♂. **Lypha dubia* Fall., ♀, Cothill, Berks, 7.v.34.—B. M. Hobby.

---

* Not previously recorded as prey of this species.

REFERENCES.

CARTER, A. E. J. 1912. Additional records of Scottish Stratiomyidae, etc. *Scot. Nat.*, **1912**: 117-8. [*Dysmachus trigonus* Mg., with *Spilogaster* sp. indet., ♀ (Dipt., Anthomyiidae), Blairgowrie, Perthshire, vi.1910-11.]

INCHBALD, P. 1860. Habits of *Asilus crabroniformis*. *Ent. Weekly Intelligencer*, **7**: 171. [*Asilus crabroniformis* with a burying beetle and a grasshopper, Devon, viii.1859.]

PEARCE, E. K. 1915. Typical Flies, **1**: 22. [*Dysmachus trigonus* Mg. with *Lucilia* sp. (Dipt., Tachinidae), Clacton-on-Sea, Essex.—Harwood.]

TUNALEY, H. 1895. [No title.] *Proc. S. Lond. Ent. Nat. Hist. Soc.*, **1895**: 62. [*Asilus crabroniformis* with *Lycaena icarus* Rott. (Lep.).]

Other references are given by B. M. Hobby, 1933, *J. Ent. Soc. S. Eng.*, **1**: 69-74 [Asilidae], 77 [Coenosiinae] and 106-10 [Cordyluridae]; 1934, *Ent. Mon. Mag.*, **70**: 185-90 [Anthomyiidae and Cordyluridae].

B. M. HOBBY.

Acherontia atropos Linn. (Lep., Sphingidae) in Hants.

On 16th August, 1934, a full-fed larva of this moth was found among potatoes at Botley, Hants. The specimen was given to Miss L. Floyd, who sent it to me for determination.

B. M. HOBBY.

Acherontia atropos Linn. (Lep., Sphingidae) in the I. of Wight.

A full-fed larva and a pupa of *A. atropos* were taken in a potato field near Brook, in the Isle of Wight, during the last week of August, 1934. K. EAST.

Attempted pairing by two males of Pieris rapae Linn. with a female Conepteryx rhamni Linn. (Lep.).

On 30th August, 1934, while watching a patch of *Buddleia*, I observed a female *G. rhamni* attempting to feed on the flowers. She was, however, prevented by the persistent advances of two male *P. rapae*. Watching them for a few moments, I was convinced that the males' attentions were most unwelcome to the female, who tried repeatedly to avoid them.

W. F. Burrows.

Macroglossa stellatarum Linn. (Lep.), immigrants at Lulworth Cove, Dorset, in 1934.

Three days, 11-13th June, were spent at Lulworth Cove, but bad weather prevailed for most of the time. During the infrequent intervals of sunshine, *M. stellatarum* alone was capable of controlled flight in the screaming wind coming in from the sea. Some collecting was attempted in a flower-covered depression on the cliff slopes, but butterflies having the temerity to take to the wing were immediately whisked away. However, I succeeded in capturing some eight or nine specimens and could have taken many more. W. F. Burrows.

Eristalis abusivus Collin (Dipt., Syrphidae) in Cornwall.

Three males and two females of the above rare species, which closely resembles *Eristalis arbustorum* L., were recently found among accessions at the British Museum (Natural History). The specimens were included in a collection made by the Hon. N. C. Rothschild at Marazion Marshes, near Penzance, v-vi, 1914. A solitary male, separated by Mr. J. E. Collin from the *arbustorum* series, hitherto represented the species in the British Collection at the British Museum.

Besides the differences mentioned by Mr. Collin in 1931, *Ent. Mon. Mag.*, **67** : 180, the females of *abusivus* appear much duller on the frons and behind the upper parts of the eyes than in females of *arbustorum*, owing to the more abundant whitish-yellow pubescence in the former species. Also, the pale pubescence on the eyes of the females of both species is strikingly longer in *abusivus*. R. L. Coe.

Medetera petrophiloides Par. (Dipt., Dolichopodidae) in Somerset.

On 28th June, 1925, I caught at Berrow, nr. Burnham, Somerset, a *Medetera*, which was determined by M. L'Abbé O. Parent as *M. petrophiloides* Par. H. Audcent.

Dorilas (Pipunculus) semifumosus Kow (Dipt., Dorilaidae) in Somerset.

On 31st August, 1933, I caught at Brockley Combe, Somerset, a *Dorilas* which I determined as *D. semifumosus* Kow and which agreed with specimens of that species that I had from France. H. AUDCENT.

Euzophera pinguis Haw. (Lep., Phycitidae) in abundance at Southampton.

By good fortune an ash tree on Southampton Common was found in July, 1933, which produced this species in unusual abundance. Fifteen specimens were counted on 7th July, twelve on 8th July, thirteen on 13th July, sixteen on 16th July, and fifteen on 19th July.

All emerged from 8 p.m. G.M.T. until dusk, and were found drying their wings at heights up to ten feet. Some were observed as dusk came on to walk higher up the trunk, and a few took flight when disturbed. Of numerous ash trees near, only the nearest showed any signs of the presence of larvae of this species. W. FASSNIDGE.

Eucosma turbidana Tr. (Lep., Tortricina) in Hants.

A number of specimens of this local Tortrix were taken at Woodmill, near Southampton, from 9th to 17th June, 1933, flying in the late afternoon among *Petasites*. Later in the year, larvae were found to be fairly common in the upper part of the rootstocks of the butterbur. Probably the insect occurs all along the Itchen valley where the food-plant occurs.

W. FASSNIDGE.

Auximobasis normalis Meyr. (Lep., Tineina) in Hants.

Four specimens of this species, determined by Mr. H. Stringer, were taken at Southampton—precise locality unknown—between 1st and 14th June, 1930. The only record of this species in England given by Meyrick (1927, *British Lepidoptera*) is as follows: Lancashire (Liverpool Docks), one in 1921.

W. FASSNIDGE.

Cateremna terebrella Zinck. (Lep., Phycitidae) in Hants.

A number of larvae of this species were found in a locality near Lyndhurst, New Forest, feeding in the small aborted cones of *Pinus abies* during February, 1934. So far as is known, the species has not before been recorded from Hants, although the late Professor E. G. R. Waters records it from near Bournemouth, just over the border, in Dorset. W. FASSNIDGE.

Laspeyresia strobilella L. (Lep., Tortricina) in Hants.

This species has been found in abundance in two Hampshire localities, namely, among spruce in a wood near Romsey, and in the New Forest, near Lyndhurst. W. FASSNIDGE.

What is Phryganea bicaudata of Linné?

It is of course not a *Phryganea* in the present-day sense. Ever since the name came into existence there has been pretty general agreement that it referred to one of the larger species of Plecoptera, and different authors have applied it to most of the common larger European species. So the name appears abundantly in the literature. It is not worth while quoting the numerous references; many of these will be found in the British Museum Catalogue of Neuropterous Insects, Pt. 1, 1852, McLachlan's Catalogue of British Neuroptera (Ent. Soc. Lond., 1870) and in Coll. Selys, Klapálek-Perlodidae (1912) and Perlidae (1923). Without going into details, it may suffice to say that different authors have used the name in the genera *Perla, Dictyopteryx* (now *Perlodes*) and *Isogenus*. Navás (Perlinos de España, *Congreso de Granada,* p. 3, 1910) applied it to *Perla maxima* auct., rejecting Pictet's views and those of McLachlan, which were given at some length in *Ent. Mon. Mag.*, Vol. VI, p. 265 (1870), from which the following passage is quoted: 'Hence the name of *bicaudata* remains as unsettled as ever and will probably sink quietly into oblivion, unless some Swedish entomologist can succeed in reinstating it. I may add that the *bicaudata* of Zetterstedt (Ins. Lapp., p. 1058), Linné's fellow-countryman, is evidently *Dictyopteryx microcephala* Pict.' (McLachlan, of course, here uses the latter name *sens. lato, i.e.* before Klapálek's revision of *Perlodes*.) McLachlan never altered his opinion that *bicaudata* Linné had nothing to do with *Perla*. He wrote to me on 27.ix.1898 as follows: 'I would remark that *D. microcephala* will probably be identified as the true *bicaudata* of Linné. It should be something with a yellow line on head and thorax and rests between the *Dictyopteryx* and *Isogenus*.'

I know nothing whatever about *Isogenus nubecula* Newman as a British insect, and all my efforts to obtain British examples have been fruitless, but McLachlan had no doubt about its occurrence and long ago informed me that he had a specimen from Burton-on-Trent. However, another insect for many years did duty in our collections for *I. nubecula,* a species with somewhat abbreviated wings in the ♀, and micropterous in the ♂. This insect is very abundant at many of our Scottish lakes and it occurs also in the English lake district, where I have taken it in numbers at Coniston. The species was separated by Kempny as *Isogenus rectus* and later transferred by Klapálek to a new

sub-genus *Dictyopterygella,* which he afterwards raised to the rank of a genus.

It is in connection with *D. recta* that the name of *bicaudata* has been revived. By the kindness of Dr. Simon Bengtsson of Lund I received a copy of his paper ' Plecopterologische Studien ein Beitrag zur Kenntnis der Plecopteren Schwedens ' (1933), a valuable contribution to the knowledge of northern Plecoptera, and of particular interest in respect of the references to certain of Zetterstedt's types. Contrary to McLachlan's expectations, Dr. Bengtsson found that the majority of Zetterstedt's type-examples of his *Perla bicaudata* consist of *D. recta* Kempny, the others being a smaller species of the same genus with full wings in both sexes, which he has described as new under the name of *D. subfissa* but which appears to be very near *D. nanseni* Kempny. Bengtsson has accordingly adopted the name *D. bicaudata* (Zett.) for *recta* (Kempny) writing as follows: ' Diese Art umfasst, wie eine Untersuchung der im hiesigen Entom. Museum aufbewahrten Typexemplare zeigt, sowohl *D. recta* Kemp. wie *subfissa* n. sp.: laut den Nomenklaturregeln ist der Name *bicaudata* anzunehmen, namentlich da Zetterstedt's Beschreibung ("mas alarum rudimento") am besten auf diese Art zu beziehen ist und da ferner die meisten Examplare dieser Art angehören.'

This will involve a change of name in our British list from *D. recta* to *D. bicaudata.* The question arises whether the latter name should be attributed to Zetterstedt as Bengtsson has done, apparently ignoring any Linnean connection with it. Klapálek regarded *bicaudata* as an insoluble puzzle. Zetterstedt, however, was looking at the matter from a narrow, local, but in the circumstances more important point of view, and it can hardly be doubted that he used the name *bicaudata* for the species which of those known to him seemed to agree best with Linné's diagnosis. This species has proved to be one of the most abundant in the north and it possesses the necessary yellow line on head and thorax. *Perlodes* and *Isogenus,* which have a similar type of marking, seem to be in Sweden less frequent, although *Perlodes* occurs in numbers side by side with *D. bicaudata* at some Scottish lochs. On the whole I am of opinion that there is quite a good case for writing *D. bicaudata* (Linné), thus making an end of an old controversy. I think McLachlan's statement (*Ent. Mon. Mag.,* l.c.) must be accepted that the specimen in the Linnean cabinet associated with a label in Sir J. E. Smith's handwriting, not Linné's, has no claim to be considered a type of *bicaudata.* McLachlan did not definitely determine this old insect, but from what he says I gather that it is a *Perla* and not a species with the *Perlodes* type of markings.

Kenneth J. Morton.

Habits of the larvae of Hydroptilidae (Trichoptera).

In questions relating to Trichoptera one rarely has occasion to refer to pre-McLachlan literature. However, a few days ago I happened to take down Pictet's 'Recherches pour servir à l'histoire et à la anatomie de Phryganides,' of which the preface is dated 1st July, 1834. A small slip in the handwriting of Mr. McLachlan fell out of the book, and I venture to give its terms: 'Ent. M. M., IV, p. 17. On Good Friday (1867) collected in a tributary of the Darenth many cases of *Hydroptila* concealed in crevices on the under-surface of stones. Larvae green and apparently *H. pulchricornis* (I now think *sparsa*). Cases flattened and seed-shaped, apparently composed entirely of silk, but before the larva changes to pupa minute sand-grains coat the outer surface. The larvae spin threads and sometimes remain suspended by them in the water and regain their position just as do certain Lepidopterous larvae.'

On referring to his published note I find he goes more fully into the subject and says: 'It is well known that the larger species [of Trichoptera], with portable cases, sink rapidly to the bottom when disturbed, but in *Hydroptila* the larvae remain suspended by a thread in mid-water, in the same manner as many Lepidopterous larvae are suspended in mid-air, and by this thread they are enabled to regain their lost position without the trouble of commencing *de novo* at the bottom.'

It seems likely that the larvae of most Hydroptilidae which form very light cases, composed almost entirely of thin silken secretion, have a similar habit. In a short note Mosely (1933, *Entomologist,* **66**: 117) records that the larva of an *Oxyethira* was observed suspended 'from a weed six inches above its head and was climbing up an invisible thread, gathering it in by means of its diminutive forelegs with a similar action to that of a spider.' I see that in my own observations on the larva of *O. costalis* Curt. (1887, *Ent. Mon. Mag.*, **23**: 201) it is stated that the larva spins web freely and soon fills a small vessel full of fine threads along which it wanders.

An interesting point connected with *Oxyethira* is its occurrence in the sea. George Swainson, with whom I had correspondence on the subject at the time, recorded in the *British Naturalist,* 1894, the finding of a living larva of *Oxyethira* in the sea at the end of St. Anne's Pier, off the mouth of the Ribble. He gives good figures of the transparent case showing the larva therein, and of another specimen of the same genus from Loch Tay, together with enlarged figures of the head and fore-legs of both larvae. While it is not impossible that the *Oxyethira* may be able to live in certain estuarine waters, I am inclined to think that the Ribble specimen may have been carried seaward on loose weed from higher up the river. The Gulf of

Finland, owing to the comparatively low salinity of the water, supports a rich Trichopterous fauna. In the neighbourhood of the Zoological Station at Tvärminne, Silfvenius states that the salinity on the surface in the summer of 1904 varied between 4·94 and 5·91%, and at a depth of 18 m. between 5·41 and 6·42%. (The average salinity of the North Sea is given as 32·823% in the only authority to which I can refer at the moment.) At Tvärminne, *Agraylea multipunctata* Curt. which also belongs to the Hydroptilidae was found by Silfvenius in the sea only; but the three species of *Oxyethira* occurring in the locality were taken only at fresh waters. The Australasian *Philanisus plebejus* Wlk. (Sericostomatidae) seems to be truly a marine species, the larva, according to Tillyard, feeding on Coralline seaweed in rock-pools between tide-marks. I once found a good many Trichoptera at some rock-pools on the west coast of Scotland, and I suspect that the dragonfly *Sympetrum striolatum* Charp. also bred in these. The pools were just above high-water mark and no doubt in stormy weather and during high tides they received sea-water. There was, however, evidence of seepage of fresh water from higher-lying springs, and rainfall has also to be considered. It did not occur to me at the time to test the salinity of these pools, but they may probably be placed in the category of those to which Silfvenius gave the name 'die subsalsen Felsentümpel.' The commonest Trichopteron was *Limnophilus affinis* Curt. another species which at Tvärminne occurred only in the sea. KENNETH J. MORTON.

Empis livida Linn. (Dipt., Empid.) as a factor in the control of Tortrix viridana Linn. (Lep., Tortr.).

A short mid-day visit was made to Lord's Wood, Chilworth, Hants, on 19th June, 1934, on a dull day, when large numbers of *Tortrix viridana* Linn. were observed flying round the oak trees. The predacious Dipteron *Empis livida* Linn. was also abundant, and males were observed to be taking considerable numbers of the Tortrix as prey.

On 22nd June a further visit was made to the same locality at about 5.0 p.m. (Greenwich time) on a fine afternoon. Males of *Empis livida* were again very active and very large numbers were observed to have *Tortrix viridana* as prey. The pale green colour of the prey made them very conspicuous and they were to be seen in every direction either flying to and fro or sitting about on foliage. Numbers of dead moths were also noticed, and appeared to be prey which had been recently discarded or dropped. On this second visit the numbers of the moth on the wing appeared to be noticeably diminished, and quite as many were observed being carried as prey as were seen on the wing.

A third visit was made to the locality on 25th June at about

the same time and in fine and sunny weather, a thunderstorm accompanied by heavy rain having intervened on the 23rd. Both Tortrix and Empidid were still in numbers, though much less so than on the previous occasions, and about one in three of the moths seen were in the clutches of the Empidid.

On each occasion a search was made for pairs of the Empidid *in coitu,* but only four could be found — one pair on the 22nd and three pairs on the 25th — in each case carrying *T. viridana* as prey. Two of the pairs seen on the 25th were observed in the act of flying to the upper branches of the trees, which may perhaps explain why so few pairs were seen. It must, however, be noted that in spite of the very large number of males seen carrying prey not a single case was observed of the sexes coming together and a courtship being initiated.

In a few cases *E. livida* was observed with prey other than *T. viridana,* but such cases were few in number and considerably less than one per cent. of the total. It must, however, be borne in mind that such cases were not so conspicuous and could more easily be missed.

Tortrix viridana has been recorded before as the prey of *Empis livida* (Wood, 1858; Poulton, 1907). The first-named author must have observed this in some numbers, for in his interesting popular account of the Green Oak Moth he states: '. . . their progeny would shortly devastate a forest, were they not subject to the attacks of another insect,' and again when referring to the peculiar appearance on the wing of the Empidid with the moth as prey he states: 'A sweep of the net captured four or five.' He must, however, have allowed his imagination to lead him astray as regards the consumption of the prey, for he proceeds to emphasise the thoroughness with which the moth is sucked dry by its captor, whereas it is now well known that the captor male carries the prey intact for presentation to the female during courtship. He had also mis-determined the Empidid as *Empis tessellata* as pointed out by Poulton. Poulton lists four actual examples of *E. livida* with *T. viridana* as prey preserved in the Hope Department, Oxford, but he quotes an observation made by A. H. Hamm and W. Holland in Bagley Wood, near Oxford, 4th July, 1897: 'specimens not taken, but great numbers seen in the grasp of these Empids.'

The material captured has been presented to the Hope Department, University Museum, Oxford, for inclusion in the bionomic collections.

REFERENCES.

Wood, Rev. J. G. 1858. Common Objects of the Country, London: 140-142.
Poulton, E. B. 1907. Predaceous Insects and their Prey. *Trans. Ent. Soc. Lond.,* **1906**: 323-409. See esp. pp. 382-383.

E. Rivenhall Goffe.

Persistent courtship by male Gonepteryx rhamni Linn. of fertilised female, and attraction of male Pieris napi Linn. to female G. rhamni (Lep., Pieridae).

The following incident was observed at about 2.30 p.m. on 11th May, 1934, in the outskirts of Lord's Wood, near Rownhams, Hants.

A male and female of the Brimstone butterfly *Gonepteryx rhamni* Linn., which had presumably been engaged in aerial courtship, came under the writer's notice as they settled on the pathway. The female was apparently already fertilised and spread her wings flat on the ground, with abdomen held more or less erect, obviously to prevent copulation. The excited male walked across the outspread wings of the female and round her head, repeating the process many times, without being able to find any position satisfactory for copulation.

After two minutes the proceedings were interrupted by the arrival of a male *Pieris napi* Linn., which fluttered down to the courting pair as soon as it noticed them, but was at once energetically chased away by the male *G. rhamni*. The *P. napi* male, however, was not to be discouraged so easily, and it returned almost as quickly as the male *rhamni*, which latter had once more to chase it away; altogether this was repeated four times before the *P. napi* male decided not to return.

The interrupted courtship of the female *G. rhamni* was then resumed, the male continuing to walk round and round and across the wings of the female without finding any position suitable for copulation; during this time the female several times closed her wings vertically for a moment, spreading them out again almost immediately.

After four and a half minutes of these fruitless proceedings the male suddenly abandoned the courtship and flew away. The female remained motionless on the ground for about thirty seconds and then flew off in a different direction.

E. Rivenhall Goffe.

Vanessa atalanta Linn. (Lep., Nymph.) in March.

A specimen of this species was observed in the New Forest, Hants, on 31st March, 1934, visiting the male catkins of sallow. An attempt to net the insect in order to determine its sex and condition unfortunately failed and it did not return.

This species was unusually abundant last autumn, and it will be of interest to note the effect of the record dry winter of 1933-34 on its ability to hibernate in this country.

E. Rivenhall Goffe.

Epistrophe balteata de Geer(Dipt., Syrph.)on wing in February.

A visit was paid to the New Forest, Hants, on 17th February,

1934, in bright, warm sunshine. Numbers of a small Syrphid were found flying rather aimlessly up and down the ridings; at first sight these gave the impression of being early examples of *Melangyna quadrimaculata* Verr., but on capture they were found to be specimens of *Epistrophe balteata* de Geer, which from their dull condition had evidently hibernated. Odd specimens had been noted in previous years in March and April, but it had not previously been seen in early spring in numbers. Verrall gives 18th June to 21st November for this species.

E. Rivenhall Goffe.

Ephemeroptera in Scotland, May—June, 1934.

The following species of Ephemeroptera were taken during a fortnight's visit to the Scottish Highlands 26th May—9th June, 1934. For the determinations I am indebted to Mr. D. E. Kimmins.

Leptophlebiidae.

Leptophlebia vespertina Linn. — 3 ♂♂, 1 ♀, Abernethy Forest, Inverness-shire, 28-30.v.34; 1 ♂, 1 ♀, Granish, Inverness-shire, 29.v. 34; 1 ♀ subim., Darnaway Forest, Moray, 5.vi.34.

Paraleptophlebia submarginata Steph.—1 ♂, Granish, Inverness-shire, 2.vi.34.

Baëtidae.

Baëtis pumilus Burm. — 3 ♂♂, Bridge of Brown, Banff, 31.v.34; 1 ♂, 1 ♀, Streens, Nairn, 7.vi.34.

Baëtis sp.—1 ♀ subim., Carn Dearg, Inverness-shire, 29.v.34.

Ecdyonuridae.

Rhithrogena semicolorata Curt. — 1 ♂, Streens, Nairn, 7.vi.34; 1 ♀, Glen Einich, 6.vi.34; 1 ♀, Bridge of Brown, Banff, 31.v.34.

E. Rivenhall Goffe.

Ejected Dipterous prey of Metacrabro quadricinctus F. (Hym., Crabronidae).

The following observations refer to a small isolated colony of *Metacrabro quadricinctus* F. in the base of an oak tree at a farm situated in a wooded valley on the lower slopes of Dartmoor, near Plympton, S. Devon. A wide split in the bark of the tree, just above ground-level, had left the wood exposed, and into this the wasps were burrowing.

When this colony was first discovered, on the evening of 3rd July, 1934, excavation of burrows had been in progress. As a result, a heap of finely macerated wood-chippings—resembling very fine dark brown sawdust — had accumulated. Lying on this heap were noticed several lifeless Diptera, which appeared

to have been caught as prey and rejected by the wasps. Closer inspection on the following morning revealed others, the heap of excavated material containing a quantity of them. Several wasps were busy at work, some arriving with prey, others excavating. It was the activities of the latter that attracted attention, for as they added to the heap of excavated material they were seen to contribute not only wood chippings, but also flies. At intervals a fly, that could only recently have been stored, was dragged to the mouth of a burrow and ejected. This observation seemed to explain the presence of the flies in the waste heap. A number of these specimens—amounting to 76—was then collected. Subsequent examination showed them to be quite fresh. Except for the possibility that one or two may have been dropped accidently by a wasp before being stored, it was evident that this collection was made up of flies which had been stocked this season and subsequently ejected during the construction of new burrows.

Another visit was paid on 16th July, by which time the heap had grown and many more ejected Diptera accumulated. The waste heap was worked through thoroughly, most of it being removed and sorted over afterwards. Some 180 specimens of ejected Diptera were extracted. Not all of these were undamaged, as was only to be expected in view of the fact that some must have been lying about for many days, and scavengers, such as mites, centipedes, etc., had got to work. In addition to these more or less whole specimens, there were some Dipterous fragments, most of which were doubtless the macerated remains of ejected specimens, though some may have come from old cells. As to the wasps, they were arriving with prey in a steady stream. It was noticed that five different holes were entered, one at least being a communal entrance. Only one wasp was seen excavating, and that only for a short time, but during this period two flies were ejected.

At the same time some specimens of prey being carried by the wasps were taken from them as they arrived at the holes. These were found to be paralysed, but not in any way mutilated. Except for one or two, they proved capable of limb movements, one specimen, in fact, recovering to the extent of being able to walk and fly. The condition of ejected flies, especially those of the first batch collected, suggested that paralysing without mutilating was the normal procedure. With regard to the method by which the prey were carried, I have one note which may be worth recording. On two occasions a large example of the wasp was closely watched carring a large specimen of prey (? *Calliphora*), and each time the fly was seen to be held by the middle right leg only. The fly was tightly clasped round the neck, if the expression may be excused, with the dorsal surface uppermost. All the other legs of the wasp were free and employed in

walking.

On a further visit, two days later, I found that a considerable amount of excavation had gone on in the interval, but there were only very few newly-ejected flies. Wasps were again arriving at intervals with prey, but less frequently than before, owing no doubt to the less favourable weather (sixteen arrivals were counted in fifteen minutes, twelve being into the entrance hole already noted as being communal).

The Diptera collected have been submitted to Dr. B. M. Hobby, to whom I am much indebted for his willing help, especially for having secured the identifications in so short a time. In the lists given below, it is to be understood that the determinations are by him, except where otherwise stated. Certain species have been further submitted to Dr. F. W. Edwards and Miss D. Aubertin, to whom acknowledgments are due. The specimens have been presented to the Hope Department, Oxford University Museum.

The following is a full list of the 259 examples of ejected prey, including those collected on 4th July, and 183 more or less whole specimens collected on 16th July. Fragments, even if identifiable, collected on that date are not included. Some 42 species are represented, covering a wide range.

Anthomyiidae.	♂	♀	Total.
Alloeostylus diaphanus Wied. .	1	–	1
Coenosia tigrina F.	–	2	2
Fannia manicata Mg.	2	–	2
Helina lucorum Fall.	3	–	3
Helina quadrimaculata Fall. ...	1	–	1
Hydrotaea irritans Fall.	17	4	21
Hylemyia nigrimana Mg.	1	–	1
Mesembrina meridiana L.	2	3	5
Musca autumnalis de G.	9	6	15
Muscina assimilis Fall.	–	1	1
Muscina pabulorum Fall.	25	4	29
Mydaea impuncta Fall.	1	3	4
Orthellia caesarion Mg.	4	4	8
**Phaonia errans* Mg.	4	–	4
**Phaonia fuscata* Fall.	–	1	1
Phaonia signata Mg.	1	–	1
Polietes albolineata Fall.	–	2	2
Polietes lardaria F.	14	16	30
Pyrellia cyanicolor Zett.	4	1	5
Pyrellia lasiophthalma Mg.	–	1	1
Anthomyiid sp. indet.	–	1	1

* Det. Dr. F. W. Edwards.

	♂	♀	Total.
CORDYLURIDAE.			
Scatophaga stercoraria L.	2	5	7
Scatophaga inquinata Mg.	–	1	1
HELOMYZIDAE.			
Heteromyza sp. indet.	1	1	2
SAPROMYZIDAE.			
Sapromyza inusta Mg.	–	1	1
SYRPHIDAE.			
Syrphus albostriatus Fall.	1	–	1
Syrphus corollae F.	–	1	1
TABANIDAE.			
Haematopota pluvialis L.	6	1	7
**Therioplectes montanus* Mg. ...	–	1	1
TACHINIDAE.			
Calliphora erythrocephala Mg.	17	6	23
Calliphora vomitoria L.	8	4	12
†*Digonochaeta setipennis* Fall. .	–	2	2
Lucilia caesar L.	2	–	2
Lucilia illustris Mg.	1	?1	2
Lucilia sp. ? *sericata* Mg.	–	1	1
Melinda anthracina Mg.	–	1	1
Pales pavida Mg.	–	2	2
Phormia sordida Zett.	2	1	3
Pollenia rudis F.	18	7	25
†*Redtenbacheria insignis* Egg. .	–	1	1
Sarcophaga carnaria L.	13	–	13
Sarcophaga vicina Villen.	3	–	3
Sarcophaga sp. indet.	1	8	9‡
Total	164	94	258‡

It will be seen that there is a considerable excess of males, the ratio being very nearly 2 : 1 (in both batches). Attention may also be drawn to the records of *Therioplectes montanus* and *Redtenbacheria insignis*. The former is quite common in the Scottish Highlands and in the mountainous districts of S.W. Ireland, but although three specimens were once taken in Glamorganshire there are only two previous records for England, a female from Derbyshire and another from Dartmoor (E. R. Goffe, 1931, *Trans. Ent. Soc. S. Eng.*, **1930** (6): 97). The

* Det. Dr. F. W. Edwards.
† Det. Miss D. Aubertin.
‡ One *Sarcophaga* sp. et sex indet. should be added to this list.

second is a still more striking case, there apparently being only three previous British records, a female, without history, but apparently bred, a male in the Verrall collection from Lyndhurst and a female from the same locality in the British Museum (C. J. Wainwright, 1928, *Trans. Ent. Soc. Lond.*, **76**: 222).

The following additional eleven specimens were taken from wasps returning to their burrows on 16th July:

ANTHOMYIIDAE.	♂	♀	Total.
Mesembrina meridiana L.	–	2	2
Muscina pabulorum Fall.	1	–	1
Phaonia errans Mg.	1	–	1
Phaonia pallida F.	–	1	1
Polietes albolineata Fall.	–	1	1
Polietes lardaria F.	–	1	1
TACHINIDAE.			
Calliphora vomitaria L.	1	–	1
Lucilia sp. indet.	–	1	1
Phormia sordida Zett.	1	–	1
Sarcophaga sp. indet.	–	1	1
Total	4	7	11

Of these, *Phaonia pallida* is not represented in the first list. The female *P. albolineata* recovered to the extent of being able to walk and fly.

Certain points remain to be considered with regard to the flies in the first list. In the first place, there can be little doubt that all are truly to be regarded prey of *Metacrabro quadricinctus*. No other species of *Crabronidae*, which are scarce in the neighbourhood, has been seen frequenting this particular site. Indeed, the situation is such that other species would scarcely be expected. Two *Passaloecus corniger* Shuck. are the only other Sphecoids seen at all. The fact that a few small species are included among the prey may suggest otherwise, but I have observed, in more instances than one, a female *quadricinctus* carrying equally small prey. A small proportion of small specimens is therefore to be expected.

Secondly, there is the problem as to why these flies were ejected. I can only suggest that, during the process of extending the burrows and excavating new cells, the wasps tunnelled into cells already stocked. Such behaviour is, to say the least, unusual, but it may well be that in this particular nesting-site there was some exceptional congestion. Perhaps no burrow could be extended in any direction without running into a stocked cell. In such circumstances a good deal of clearing might be neces-

sary before burrows could be extended freely, but once this clearing had been effected the wasps could penetrate without hindrance into unoccupied wood. It may be significant that, although stocked cells must have been steadily accumulating up to 18th July, the excavation during the latter two days of this period resulted in the ejection of only very few prey. This explanation is to some extent supported by the fact that the wasps had also ejected some cocoons that had not yet hatched. A number of macerated empty cocoons were found among the excavated material, together with a few adults that had not quite reached a condition fit for emergence, and which had evidently been extracted from some of the above cocoons by the wasps.

Finally, one might point to the fact that the wasps found no use for the rejected flies in stocking newly-made cells, though, when first ejected, the flies were evidently in a suitable condition for the purpose. This seems one of those familiar cases of the inadaptability of complex instinctive behaviour, a feature which has of course been well illustrated among the fossorial Hymenoptera. G. M. Spooner.

Coccidae (Hemipt.) taken in Dorset and Surrey.

A few Coccidae were collected in the neighbourhood of Swanage (Dorset) between the 19th and 27th May, 1934, and in the neighbourhood of Surbiton (Surrey) between the 4th and 11th August, 1934.

Chionaspis salicis Linn.—This species was quite common on ash in the lanes around Swanage, and also occurred on willows at Durlston Bay, near Swanage. At Surbiton many ash trees were found to be infested by the same species.

Lepidosaphes ulmi Linn.—Very common on hawthorn and blackthorn both at Swanage and Surbiton.

Lecanium corni Bouché.—Found in some numbers on dog-rose at Tolworth, near Surbiton.

Lecanium coryli Linn.—Occurred abundantly on wych elm and less frequently on hawthorn at Durlston Bay, and was also abundant on common elm at Surbiton.

Lecanium bituberculatum Targ.—Common on hawthorn in hedgerows at Swanage.

Pulvinaria vitis Linn.—A number of male puparia and of females in various stages were taken from the stems of flowering currant bushes at Durlston Bay.

Asterolecanium variolosum Ratz.—Abundant on the twigs of certain oaks at Tolworth.

I am indebted to Mr. E. E. Green for kindly confirming my identification of *L. coryli* and *P. vitis*.

Fredk. J. Killington.

Some records of Neuroptera collected by Dr. O. W. Richards.

By the kindness of Dr. Richards I have recently received the following for determination :—

CONIOPTERYGIDAE.

Coniopteryx tineiformis Curt.—A female, near Henley, Oxon, 10th June, 1934.

Semidalis aleurodiformis Steph.—A male, on oak, Bagshot, Surrey, 3rd June, 1934; a female, at honey-dew on maple, near Henley, 10th June, 1934.

HEMEROBIIDAE.

Micromus variegatus Fabr. — A female on *Sisymbrium officinale* Linn., Slough, Bucks, 8th Aug., 1933.

M. paganus Linn.—A female, taken on the wing, Slough, 8th June, 1932; a female, on horse-chestnut, Slough, 26th May, 1934.

M. angulatus Steph.—A male, on horse-radish, Slough, 23rd Aug., 1933.

Hemerobius humulinus Linn. — A male, on shrubs, Slough, 9th May, 1933; a male, on birch, Hedgerley, Bucks, 13th May, 1934.

H. stigma Steph.—A female, Glen Torridon, Ross-shire, 5th June, 1934.

H. micans Oliv. — A female, taken on the wing, Burnham Beeches, Bucks, 30th April, 1933; a female, on beech, Windsor Forest, Berks, 13th May, 1934.

H. lutescens Fabr.—A male, on *Acer* sp., Slough, 23rd Aug., 1933.

Boriomyia subnebulosa Steph.—A male, at light, Slough, 5th Oct., 1933.

Wesmaelius quadrifasciatus Reut.—A female, on pine, Slough, 11th June, 1934.

Sympherobius pygmaeus Ramb. — A female, on bamboo, Slough, 29th Aug., 1933.

S. elegans Steph.—A male, taken on a window, Goudhurst, Kent, 11th June, 1933.

CHRYSOPIDAE.

Chrysopa carnea Steph. — A female, on shrubs, Slough, 3rd Oct., 1931; a female, at light, Slough, 12th July, 1933. A larva of this species was taken at Slough, on cabbage infested with *Brevicoryne brassicae* Linn., on the 10th Aug., 1933; cocoon spun 16th Aug., pupa emerged 31st Aug., but died before disclosing the imago. A second larva was found on cabbage in the same locality feeding on a Syrphid puparium (*Sphaerophoria* sp.), 5th Sept., 1933; this spun a cocoon on the 9th Sept., and a female emerged 26-27th Sept.

C. ventralis Curt., form *prasina* Burm.—A male, bred from old galls (*Rhabdophaga* sp.), on *Salix alba* Linn., Slough, 1st June, 1934.

In addition to the above Neuroptera, the collection included a male *Raphidia xanthostigma* Schum. (Megaloptera), taken on oak, Hedgerley, 13th May, 1934.

F. J. Killington.

Araujia sericifera Brot. and its Insect Visitors.

In the issue of the *Gardeners' Chronicle,* dated 16th December, 1916, there appeared what purported to be a sketch of a spray of this plant and an editorial note briefly describing the method by which insects are trapped by the flowers. As every important detail in the sketch is incorrect and the description largely so, I venture to offer the following account as the result of my observations on two plants growing in the garden of my house at Tresillian, Cornwall.

The Brazilian Bladder-flower is one of a genus of tropical and sub-tropical American climbing plants and was formerly known as *Physianthus albens* Mart. and *Aroujia albens* G. Don.

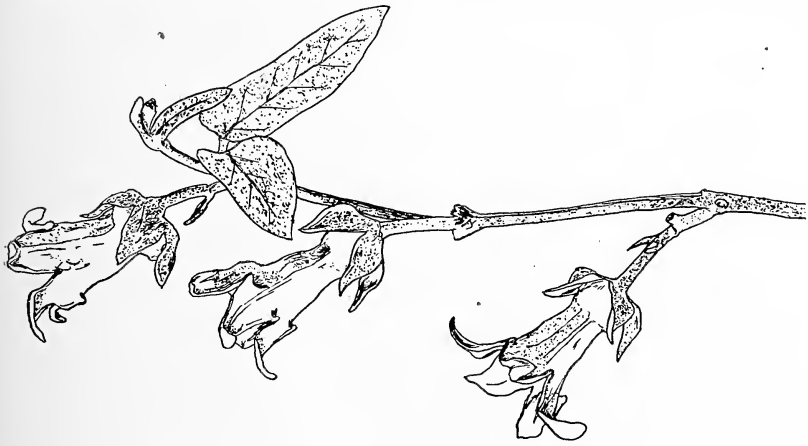


Fig. 3.—*Araujia sericifera* Brot. Flowers rosy-white.

It is a member of the order Asclepiadeae, most of the genera of which possess a curious mechanism for effecting cross-pollination, and the species are sometimes known as 'pinch-trap' flowers. In the sketch referred to above, the flowers are fanciful and the leaves not rightly shaped; the pollinia are incorrectly drawn; and the method by which the insect's tongue is trapped is quite wrong. The spiral uncoiling of the moth's tongue in the picture is also purely imaginary, and as untrue to nature as 'artistic' pictures so often are.

Araujia sericifera is glabrous and somewhat glaucous, and the shape and general habit of the leaves and flowers is well shown in Fig. 3. The flowers are milky-white, lined and speckled with rose, especially along the middle of each petal; some flowers are almost entirely white and others almost entirely rose, but all are sweetly scented. The scent is not very individual, and suggests to me diluted honeysuckle. The whole plant contains a milky juice, most abundant in the leaves and newest shoots, and this tastes hot, like that of the spurges, but much less acrid. My plants have not set any fruits, although they flowered freely last year for the first time, but the capsule that came to me from the French Riviera was about 2 inches long and contained a number of nearly black seeds, each crowned with pure white silky hairs, from which the plant presumably gets its specific name.

The curious feature common to these 'pinch-trap' Asclepiads is the possession by each of the five stamens of a tiny pad, or

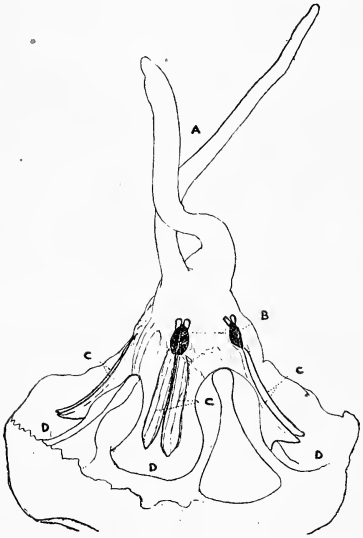


Fig. 4.—A flower with petals removed.

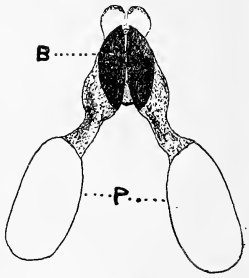


Fig. 5.—Clip and pollinia.

clip, grooved longitudinally on its outer face and bearing two short lateral arms, each terminating below in a pollinium substantially similar in shape to those of the genus *Orchis* (Fig. 5). In *Araujia* the pads are dark brown, and the yellowish-green pollinia when *in situ* are hidden behind two flat staminal plates separated from each other by a very narrow and straight furrow, which is exactly in line with the groove of the little pad already described and forms with it a continuous channel immediately over the nectary.

The five little clips can be easily seen when one looks down the tube of a flower, but the pollinia are entirely invisible behind the staminal plates. The swollen base of the corolla tube contains the five nectaries.

Projecting upwards in the corolla from the more or less conical summit of the ovary are two processes that I take to be styles, but they bear nothing that can be called a stigma, unless a slight scaliness or granulation is to be interpreted as such. These styles are usually curved or bent rather fantastically, of which Fig. 4 gives a good idea at A; two clips are seen at B; staminal plates at C, projecting outwards over the nectaries at D.

Fig. 5 is a clip with its pollinia, and Fig. 6 shows them *in situ* with one of the staminal plates removed, revealing the pollinium behind it, the other being indicated in dotted outline. It should be mentioned here that C in Figs. 4 and 6 really indicates the prominent ridges of two adjacent staminal plates, between which is the narrow furrow or channel already referred to; the rest of each plate extends laterally and is quite flat. The

FIG. 6.—One pair of pollinia *in situ* (one staminal plate removed).

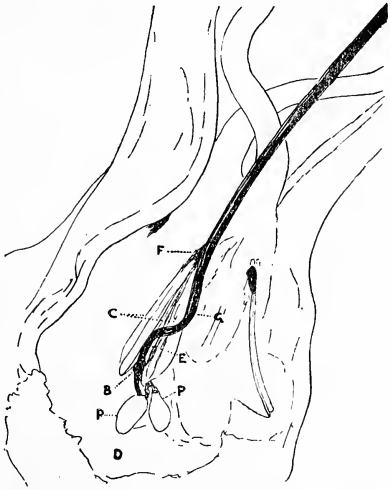


FIG. 7.—Moth's tongue trapped between staminal plates.

object of these plates appears to be to restrict the play of the visiting insect's tongue and more or less to compel it to pass through the groove of the clip and the furrow between the plates, so that the tongue may become fixed in the clip, which will be dragged out with its attached pollinia when the tongue is withdrawn. The pollinia are then available to be carried to another flower, the stigmata of which may be pollinated when the insect inserts its tongue into the corolla tube. Fig. 7 shows the long tongue of a moth which, in its struggles to escape from

the clip, has thrust the latter (B) with the pollinia (P) almost into the nectary (D), and the tongue has actually been bent (G) above the point (E) where it has been caught and held in the furrow between the staminal plates (C). This seems curious, and I think the probable explanation is that the moth, having withdrawn the clip and pollinia attached to its tongue in the correct way, pushed it further in to get at the nectar, which the engagement with the clip had frustrated at its first attempt, and, having obtained its little drink, withdrew its tongue in such a way that the tip with the attached clip and pollinia became firmly wedged in the furrow between the staminal plates and was bent, as shown, in the moth's endeavour to disengage it. The diagram suggests that there is something holding the tongue at F also, but this effect is not apparent in the photo-print from which the diagram was made, which shows sufficiently clearly that there is a space between the tongue at this point and the place behind it from which the clip was dragged.

The mechanism in the genera of the sub-order Cynanchoideae of Asclepiadeae varies somewhat with the different arrangement of the parts and shape of the flower in the various genera, but the 'clip and pollinia' feature is common to all. An interesting distinction between the genera is that whilst the important organ for pollination is the insect's tongue in the case of *Araujia, Boucerosia, Ceropegia, Stapelia, Stephanotis* and *Vincetoxicum,* for *Asclepias, Gomphocarpus* and *Hoya* the feet of the visiting insects act as carriers of the pollinia. In the other sub-order, Periplocoideae, the mechanism is quite different and approximates to that of the Orchid family Ophryoideae.

In Brazil and Buenos Aires *Araujia* is pollinated by humble-bees, and the trapping of other insects does not seem to have been observed there, or, at any rate, has not been reported. It would appear, therefore, that evolution has weeded out the undesirable visitors there, but here and in other countries foreign to the plant evolution has not yet had time to act, as the plant has not been cultivated for a sufficiently long period. Besides S. America, its native habitat, it is cultivated in N. America, Italy, Southern France, Jersey and the Orange River Colony, and doubtless many other countries, and I have notes of it in Cornwall, Dorset, Hants and Sussex, in all of which places its moth-catching capabilities are known. I have also records of its flourishing growth in Surrey, Yorkshire, Edinburgh and Kincardineshire, but no reference to insect captures in those places.

The capture or escape of the visiting insects depends on several circumstances, of which the principal seems to be the strength of the insect and its capability to pull away the clip in which its tongue has become fixed. Humble-bees are obviously strong insects, and it is, therefore, not remarkable that they are the chief, if not the only, pollinators of *Araujia* in its native

country. I saw only one of these insects—a worker of *Bombus agrorum* F.—visit one of my plants, and it certainly got away without any difficulty, but it was too quick, and in too awkward a position for me to see whether it carried away the pollinia; apparently it visited only one flower. It seems remarkable that since humble-bees are the natural agents of pollination of *Araujia* in its S. American home they should not be more frequent visitors to it here. Hive-bees, on the contrary, find the flowers very attractive and there were always plenty visiting my plants. Yet I saw only two trapped, and this brings me to the second circumstance on which the trapping depends, *viz.* the mode of approach of the insect. The majority of the flowers are more or less pendant with the mouth of the corolla pointing downwards, so that insects have to creep up it to reach the nectar. A small heavy insect, such as a hive-bee, would naturally alight on the lowest of the petals, and by creeping along could insert its tongue into the nectary without any risk of being trapped, provided it kept well down on the tube of the flower. If, however, it wandered on to the styles and tried to reach the nectar from there, its tongue might easily be caught in a clip. Similar conditions would apply to butterflies, except that as these insects have very long tongues, which are usually arched when they are inserted into flowers and the insects would not need to creep far in, the arch would be very liable to be caught by a clip, if the tongue entered below the styles, or the tip if it entered above the styles. Very few butterflies were attracted to my plants, and I found only one (*Pieris rapae* L.) caught, and by almost the extreme tip of its tongue, the butterfly's head being only just within the mouth of the corolla. The only other butterfly record I have is that of *Pieris brassicae* L. in south Europe. In the case of moths the tongue is not usually arched on insertion, and the moths I found caught were all *Plusia gamma* L., of which thirteen fell victims during September and October, mostly in the latter month; but I have not the least doubt that many others managed to get away, even after being trapped, because I found that by encouraging some of them to struggle more violently, several succeeded in releasing themselves, and in at least two cases I could see the pollinia attached to the moth's tongue as it flew off. Several others got away minus the tip of the tongue, which was found firmly fixed in a clip. *Plusia moneta* F. and *P. chrysitis* L. have been found trapped in south Europe and *P. precationis* Guen. in N. America.

In south Europe *Hadena oleracea* L. is very commonly trapped by the flowers; but my plants did not begin to flower until August, and no local specimens were victimized as this moth flies in June.

Sphinx ligustri L., *Herse convolvuli* L., *Sesia stellatarum* L., *Hippotion celerio* L., and *Hyles euphorbiae* L. have also been

reported as trapped, but it is hard to believe that these powerful insects could possibly fail to drag out the clips, and I can only conclude that as they have very long tongues they must have been caught by the staminal plates in some such way as that shown in Fig. 7 and already described.

The only other moth recorded as visiting the flowers is a specimen of *Peridroma saucia* Hübn., which got away without difficulty, and, I think, did not carry away any pollinia.

Diptera are attracted by the flowers, and bluebottles are recorded as observed in numbers, and many trapped, at Menabilly, in Cornwall, but I saw very few at our plants. The only other Dipterous insect attracted was *Rhingia campestris* Mg., many of which are to be found in our verandah, and nine specimens were found trapped. This is a Syrphid fly very fond of flowers and much given to roaming about amongst herbage. It is attracted to our verandah by the flowers of *Clematis flammula* L., and flies up to the glass roof, where it spends hours trying to get out through the glass.

These are all the records known to me of insect visitors to *Araujia sericifera,* and I shall be glad to hear of any other species, especially if trapped. If readers will send me the flowers with the trapped victims *in situ* I shall be happy to name the specimens where required.

A third circumstance in connection with the trapping was put forward by E. Marchand and S. Bonjour (1899, *Soc. Sci. Nat. Bull.,* Nantes, **9** (1) : 57-84) to explain why not all the insects visiting the flowers were caught. They concluded that insects were captured by immature flowers only, the staminal plates being at that time stiff and resistant; but when the flowers are mature the plates become less rigid and do not offer sufficient resistance to the withdrawal of the insect's tongue. It is quite possible that this is so, but the possibility did not occur to me and I have only recently come across this explanation. Each flower remains open and apparently fresh for several days, and the scent is given off all the time. I could not decide that the scent was stronger by day than by night, but the scarcity of visits by nocturnal insects was very noticeable.

I do not understand why no fruits matured on my plants last year in view of the hot summer, which one would have thought particularly favourable, especially as a correspondent reported in *Gardening Illustrated* that a plant in her garden at Dorman's Park, Surrey, had fruited last year for the first time. It has flowered well every summer for the last three or four years in a sheltered position on a south wall, although the soil is a cold clay and the house is in a ' frost hole.' As our soil here is a cold, stiff loam and we also are in a ' frost hole ' — the coldest valley in Cornwall — I conclude that our plants are not yet old enough to ripen their fruits and must wait until the next hot summer!

Interested readers are referred to P. Knuth and J. R. A. Davis (1909, 'Handbook of Flower Pollination,' Oxford, **3**: 90-96) and A. Kerner and F. W. Oliver (1895, 'The Natural History of Plants,' London, **2**: 257-260) for further information about the pollination of Asclepiadeae.

In conclusion, I have very much pleasure in acknowledging my indebtedness to Mr. W. H. T. Tams of the British Museum (Natural History) for kindly preparing the drawing of Fig. 3 from a specimen, and the diagrams, Figs. 4-7, from photo-prints taken by himself.*

C. NICHOLSON.

*Since writing the above I should like to add that 1934 has again been dry and hot and the first *Araujia* flower opened on August 1st, the plant being now in full bloom.

Hive bees are visiting it freely and I have seen one large and one small worker of *Bombus agrorum* at the flowers, but no *Plusia gamma*, which has been scarce here this year. No *Rhingia* has been seen at the flowers and no insect of any kind has been trapped up to the present.

14th September, 1934. C.N.

CONTENTS—CONTINUED.

PAGE

FREEMAN, J. R., L.D.S., R.C.S.: Prey of *Aeshna cyanea* Müll. (Odon.) 35

GOFFE, E. R.: *Empis livida* Linn. (Dipt., Empid.) as a factor in the control of *Tortrix viridana* Linn. (Lep., Tortr.) 45

———— Persistent courtship by male *Gonepteryx rhamni* Linn. of fertilised female, and attraction of male *Pieris napi* Linn. to female *G. rhamni* (Lep., Pieridae) 47

———— *Vanessa atalanta* Linn. (Lep., Nymph.) in March 47

———— *Epistrophe balteata* de Geer (Dipt., Syrph.) on wing in February 47

———— Ephemeroptera in Scotland, May—June, 1934 48

HOBBY, B. M., M.A., D.Phil., F.R.E.S.: Predacious Diptera and their Prey 35

———— *Acherontia atropos* Linn. (Lep., Sphingidae) in Hants 39

KILLINGTON, F. J., B.Sc., A.L.S., F.R.E.S.: Coccidae (Hemipt.) taken in Dorset and Surrey 53

———— Some records of Neuroptera collected by Dr. O. W. Richards 54

MORTON, K. J., F.R.E.S.: What is *Phryganea bicaudata* of Linné? 42

———— Habits of the larvae of Hydroptilidae (Trichoptera) 44

NICHOLSON, C.: *Araujia sericifera* Brot. and its Insect Visitors 55

SPERRING, A. H.: *Ecphoropsis vexans* Hlmgr.: an Ichneumonid (Hym.) new to Britain 29

———— *Melitaea aurinia* Rott. (Lep.): flying powers .. 29

SPOONER, G. M., M.A.: Ejected Dipterous prey of *Metacrabro quadricinctus* F. (Hym., Crabronidae) 48

Communications for publication in this *Journal* should be sent to the Editor at 22, Litchfield Road, Bitterne Park, Southampton.

SOCIETY FOR BRITISH ENTOMOLOGY

List of Publications for Sale at the Nett Prices shewn.

(All prices are post free.)

SYSTEMATIC WORKS.

BRITISH HEMIPTERA-HETEROPTERA. By Hugh P. Jones, F.R.E.S. 1930. 88 pp. with 2 Plates. Price 5*s.* 6*d.*

BRITISH NEUROPTERA. By F. J. Killington, B.Sc., A.L.S., F.R.E.S., etc. 1929. 36 pp., 6 Plates, 6 Text figs. Price 5*s.* o*d.*

BRITISH TABANIDAE (Diptera). By E. Rivenhall Goffe. 1930. 71 pp., 2 Plates. Price 5*s.* o*d.*

BRITISH TIPULINAE (Diptera). By H. L. F. Audcent. 1932. 35 pp., 3 Plates. Price 4*s.* o*d.*

KEYS TO BRITISH ASILIDAE (Diptera). By B. M. Hobby, M.A., D.Phil., F.R.E.S. 1932. 6 pp. Price 1*s.* 9*d.*

MEIGEN'S 'NOUV. CLASS.' 1800. By E. Rivenhall Goffe. 1932. 7 pp. Price 1*s.* o*d.*

FAUNAL LISTS.

TORTRICES OF HANTS AND I.O.W. By W. Fassnidge, M.A., F.R.E.S. 1929. 20 pp. Price 2*s.* 6*d.*

MACRO-LEPIDOPTERA OF HANTS AND I.O.W. By W. Fassnidge, M.A., F.R.E.S. 1925. 42 pp. Price 2*s.* 6*d.*

HYMENOPTERA ACULEATA OF HANTS AND I.O.W. By Hugh P. Jones, F.R.E.S. 1926. 13 pp. Price 1*s.* o*d.* With Supplement, 1932, 1*s.* 6*d.*

PARANEUROPTERA OF HANTS AND I.O.W. By F. J. Killington, B.Sc., A.L.S., F.R.E.S., etc. 1926. 9 pp. Price 1*s.* o*d.*

LIST OF BRITISH COLLEMBOLA. By F. A. Turk, F.Z.S., F.R.E.S. 1933. 6 *pp.* Price 1*s.* o*d.*

Other Faunal Lists no longer available as separates will be found in the Transactions and Journal.

GENERAL WORKS.

'ENTOMOLOGY AND ETHICS.' By W. Fassnidge, M.A., F.R.E.S. (Presidential Address, 1931). 1932. 16 pp. Price 1*s.* o*d.*

BIBLIOGRAPHY OF ENTOM. NOTES IN PUBLICATIONS OF BRITISH LOCAL SOCIETIES. Part I. Price 2*s.* 6*d.* (An indispensable Supplement to the Zoological Record.)

SERIAL PUBLICATIONS (Ent. Soc. S. Engl.).

THE JOURNAL.

VOL. I, PART I. April, 1932. Price 2*s.* 6*d.*

VOL. I, PART II. November, 1932. Price 2*s.* 6*d.*

VOL. I, PART III. May, 1933. Price 2*s.* 6*d.*

VOL. I, PART IV. December, 1933. Price 2*s.* 6*d.*

TRANSACTIONS, VOLS. I — IV, were issued by the Entomological Society of Hampshire, and are out of print. Copies occasionally become available, however, and those desiring to be informed of such should register their names with the Hon. Secretary.

The subscription to the Society, which includes copies of all matter published during the period covered, is 21*s.* o*d.* per annum.

THE TRANSACTIONS.

VOL. V. 1929. 100 pp. 7 Plates. Price 7*s.* 6*d.*

VOL. VI. 1930. 150 pp. 2 Plates. Price 10*s.* 6*d.*

VOL. VII. 1931. Part I. 55 pp. Price 7*s.* o*d.*

VOL. VII. 1931. Part II. 86 pp. Price 10*s.* 6*d.*

VOL. VIII. 1932. Part I. 64 pp. 5 Plates. 2 Text figs. Price 8*s.* o*d.*

VOL. VIII. 1933. Part II. 76 pp. Price 7*s.* o*d.*

The List of Contents of any Volume will be sent on request.

Orders, accompanied by the appropriate remittance, should be addressed to **E. Rivenhall Coffe,** Hon. Sec., 102, High Street, **Southampton.**

VOL. 1. PART 3.

JOURNAL

OF THE

SOCIETY FOR BRITISH ENTOMOLOGY

(Formerly known as The Entomological Society of the South of England)

EDITOR:

F. J. KILLINGTON, B.Sc., A.L.S., F.R.E.S.

ASSISTANT EDITOR:

B. M. HOBBY, M.A., D.PHIL., F.R.E.S.

DATE OF PUBLICATION: 22nd APRIL, 1935.

Copies may be purchased from the Secretary at 102, High Street, Southampton.

Price 2s. 6d., post free.

CONTENTS.

PAGE

AUDCENT, H. L. F. : Tipulidae (Dipt.) from the Scottish Highlands 90

———— *Sziladynus montanus* Meig. (Dipt., Tabanidae) in Cheshire 90

BROWN, S. C. S. : The house sparrow preying on Lepidoptera 70

———— *Euphydryas aurinia* Rott. (Lep.): flying powers 70

———— *Nonagria sparganii* Esp. (Lep.) in Hampshire 70

———— *Ourapteryx sambucaria* Linn. (Lep.) : double-brooded 70

COE, R. L. : Female of *Platychirus melanopsis* Loew (Dipt., Syrph.) in Inverness-shire 79

CROSSLEY, E. L., B.Sc., A.I.C., F.L.S. : Butterflies of the Somerset-Dorset border country in 1934 ... 72

DIBB, J. R., F.R.E.S. : Coleoptera attracted to light 76

———— An entomologist's collecting case 77

GOFFE, E. R. : An interesting melanic aberration of *Aglais urticae* Linn. (Lep., Nymph.) 89

HINCKS, W. D., M.P.S., F.R.E.S. : Ephemeroptera in the Lake District 74

———— and DIBB, J. R., F.R.E.S. : Preliminary note on a probable addition to the British list of Ephemeroptera 75

HOBBY, B. M., M.A., D.Phil., F.R.E.S., and ELTON, C. S., M.A. : Mortality in the dung-fly, *Scatophaga stercoraria* Linn. (Dipt., Cordyluridae) ... 71

KERRICH, G. J., M.A., F.L.S., F.R.E.S. : Two new records of *Metopius dentatus* Fabr. (Hym., Ichneumonidae) 70

KILLINGTON, F. J., B.Sc., A.L.S., F.R.E.S. : *Chrysopa albolineata* nom. nov. for *Chrysopa tenella* Schneid. (Neur.) 87

(*Continued on page 3 of cover.*)

JOURNAL OF THE SOCIETY FOR BRITISH ENTOMOLOGY

VOL. I. 22ND APRIL, 1935. PART 3.

Psectra diptera Burm. (Neur., Hemerobiidae) in Britain.

It is with considerable pleasure that I record the capture of an example of this interesting Hemerobiid. It was taken by Mr. H. St. J. Donisthorpe at Wicken Fen on 10th September, 1934. Mr. Donisthorpe tells me that he found it whilst searching amongst cut sedge for Coleoptera. This is the first recorded capture of this insect in the British Isles for over thirty years. It is a male, of the brachypterous 'two-winged' form, the only form which I have so far seen from Britain.

I take this opportunity of summarising such information as we have on the four other British examples known.

1. Somerset, Breach Wood, near Langport, 'taken off a hazel-bush,' 27.vi.1843, J. C. Dale. (A male, in the Hope Department, University Museum, Oxford.)
2, 3. Wexford, banks of the R. Slaney, beaten from amongst bushes, including hazel and alder, vii.1900, J. N. Halbert. (A male, in Dublin Museum; another specimen in Mr. King's collection, Glasgow University).
4. Dumfriesshire, banks of R. Nith, between Kingholm and Kelton, by sweeping, 29.vii.1902, B. McGowan. (A male, possibly in the McLachlan collection.)

Mr. Donisthorpe has presented his specimen to the British Museum (Natural History).

D. E. KIMMINS (*Dept. of Entomology, British Museum, Nat. Hist.*).

A New Locality for Boriomyia rava Withyc. (Neur.).

Amongst some Neuroptera sent for determination from the Farnham House Laboratory this year, I discovered a small series of this rather local Hemerobiid. The captor, Mr. F. Wilson, tells me that they were taken at Brookwood in Surrey, 28.v.34 and 5.vi.34, in a small pine wood behind the village. He thinks he has also taken the species amongst pines at Horsell Common, Surrey, but this record is not certain. The only other known locality for this species is at Oxshott, Surrey, where it is usually rather scarce. I believe that this species frequents the upper parts of the trees rather than the lower branches, as the only occasion on which I have seen it in numbers was a morning when the insects were emerging from the pupal state and crawling

over the tree trunks. A visit to the place later in the day revealed very few specimens, although Hemerobiids could be seen flying amongst the upper branches.

D. E. Kimmins (*Dept. of Entomology, British Museum, Nat. Hist.*).

Plecoptera, Megaloptera, Neuroptera, Mecoptera and Trichoptera from Aberdeen and district.

The following list has been compiled from a collection made by Dr. Guy D. Morison, Marischal College, Aberdeen. Dr. Morison tells me that the list is by no means exhaustive, as he has hitherto not made a habit of collecting Neuroptera. Hemerobiidae are quite common, but Chrysopidae are very much scarcer than in the south of England.

PLECOPTERA.

Taeniopterygidae.

Taeniopteryx risi Morton.—Craibstone, 13.vi.32.

Nemouridae.

Nemoura variegata Oliv.—Craibstone, 13.vi.32.

MEGALOPTERA.

Sialidae.

Sialis lutaria L.—Aberdeen, 31.v.31.

NEUROPTERA.

Coniopterygidae.

Conwentzia psociformis Curt.—Craibstone, vii.24, on *Ilex aquifolium* L.

Coniopteryx tineiformis Curt.—Torphins, vii.24; Potarch, 3.vi.28; Kincardineshire, Banchory, vii.27; all on *Pinus sylvestris* L.

Hemerobiidae.

Micromus paganus L.—Craibstone, 23.vii.30, vii.32, on oak; Aberdeen, 1925, 1929.

Hemerobius nitidulus Fab.—Aberdeen, 1924.

H. micans Oliv.—Craibstone, 17.vi.32, 23.vii.32; Kincardineshire, 1931.

H. marginatus Steph.—Aberdeen, 1929.

H. lutescens Fab.—Craibstone, 23.vii.30, 13.vi.32; Kincardineshire, Banchory, 25.vii.32, on *Betula alba* L.

H. humulinus L.—Aberdeen, vii.25; Craibstone, 13.vi.32.

H. simulans Walk.—Aberdeen, 1925, 1926, 1927; Craibstone, 23.vii.32; Kincardineshire, 1926, 1927; Banchory, 25.vii.32, on *Betula alba* L.

H. stigma Steph.—Craibstone, 26.v.30; on *Pinus sylvestris* L., 13-17.vi.32. Pitfour, 6.v.30, on *Pseudotsuga douglasii* Carr.

Boriomyia betulina Strøm.—Aberdeen, 1927; Kincardineshire, 1931.

CHRYSOPIDAE.

Chrysopa vittata Wesmael. — Torphins, viii.24; Craibstone, 23.vii.30.

C. ciliata Wesmael (=*C. alba* auct.).—Kincardineshire, Maryculter, vi.25, on *Fagus sylvatica* L.

C. tenella Schn.—Aberdeen, ix.34, in garden.

C. carnea Steph. (=*C. vulgaris* Schn.).—Aberdeen, 12.iv.21; iv.31, in house; vii.31, viii.34, in garden.

MECOPTERA.

PANORPIDAE.

Panorpa germanica L. — Kincardineshire, Muchalls, vii.30, 16.vi.31, vii.31, vii.34; Banffshire, Cullen, viii.32. Of this species Dr. Morison writes: 'This is the species (one?) that is common amongst the thick vegetation of the cliffs fringing the sea. I have never seen species of *Panorpa* inland,' referring, of course, to the neighbourhood of Aberdeen. Some of the examples incline towards the form *borealis* Steph.

TRICHOPTERA.

LIMNOPHILIDAE.

Glyphotaelius pellucidus Retz. — Aberdeen, 1928, 19.vi.31, vi.32.

Limnophilus flavicornis L.—Aberdeen, viii.32.

L. lunatus L.—Craibstone, 3.ix.31.

L. centralis Curt. — Craibstone, 13.vi.32; Kincardineshire, 20.v.33.

Stenophylax stellatus Curt.—Craibstone, 3.ix.31.

Micropterna sequax McL.—Aberdeen, viii.31.

SERICOSTOMATIDAE.

Sericostoma personatum Spence.—Parkhill, 8.vii.31.

LEPTOCERIDAE.

Leptocerus nigronervosus Retz.—Parkhill, 9.vii.31.

HYDROPSYCHIDAE.

Hydropsyche instabilis Curt.—Aberdeen, 22.vii.31.

RHYACOPHILIDAE.

Rhyacophila dorsalis Curt.—Aberdeen, 1930.

D. E. KIMMINS (*Dept. of Entomology, British Museum, Nat. Hist.*).

British Ephemeroptera, Plecoptera and Trichoptera in 1934.

This list is based upon material sent to Mr. M. E. Mosely or myself for determination at the British Museum, and much of it has been presented to the Museum. All records refer to the

year 1934, unless otherwise stated, and the initials in brackets following the dates represent collectors' names, as follows :— K.G.B., Dr. K. G. Blair; J.O.C., Mr. J. Omer-Cooper; W.E.C., Mr. W. E. China; T.B.F., Mr. T. Bainbrigge Fletcher; L.W.G., Rev. Prof. L. W. Grensted; and O.W.R., Dr. O. W. Richards.

The following localities are represented: — BERKSHIRE: Hinksey. BRECKNOCK: Builth, Llanthony Abbey. CARDIGANSHIRE: Aberystwyth, Llancurig, Llanfarian, Llangorwen, Llanon, Llanrhystyd, Pont Erwydd, Plynlimmon, Rhayader, Rhyd-y-felin. CHESHIRE: Chelford. CUMBERLAND: R. Caldew, Raughton Head. DURHAM: Easington. GLOUCESTERSHIRE: Stroud, Symonds Yat. HAMPSHIRE: Niton, I.W., Ringwood. HERTFORDSHIRE: Hoddesdon. INVERNESS: Aviemore. LANCASHIRE: Altcar. MIDDLESEX: Stanmore Common. NORTHUMBERLAND: Pigden, Plessey Wood. OXFORDSHIRE: Marston, Woodstock, SHROPSHIRE: Bridgnorth. STAFFORDSHIRE: Rugeley, Weeford. SURREY: Elstead, Milton Street (near Westcott), Virginia Water, WARWICKSHIRE: Stonebridge. WILTSHIRE: Christian Malford, Marlborough. WORCESTERSHIRE: Alvechurch, Redditch.

EPHEMEROPTERA.

EPHEMERIDAE.

Ephemera vulgata L.—Oxford, R. Thames, 15.v. (L.W.G.).

E. danica Müll.—Oxford, R. Thames, 20.v. (L.W.G.). Stroud, 3.vi. (T.B.F.).

LEPTOPHLEBIIDAE.

Leptophlebia marginata (L.).—Virginia Water, 29.iv. (J. F. Perkins).

L. vespertina (L.).—Aviemore, vi.-vii. (K.G.B.).

Paraleptophlebia submarginata (Steph.).—Christian Malford, 9.v.; Woodstock, 16.v.; Oxford, R. Thames, 11.v.; Hinksey, 19.vi. (L.W.G.). Milton Street, 15.v. (W.E.C.). Aviemore, vi.-vii. (K.G.B.). Plessey Wood, 9.vi. (J.O.C.).

P. cincta (Retz.).—Plessey Wood, 30.vi.-4.vii. (J.O.C.).

Habrophlebia fusca (Curt.). — Plessey Wood, 30.vi.-4.vii. (J.O.C.).

EPHEMERELLIDAE.

Ephemerella ignita (Poda).—Plessey Wood, 4-10.vii. (J.O.C.).

CAENIDAE.

Caenis horaria (L.).—Rugeley, 11.vii. (L.W.G.).

BAËTIDAE.

Baëtis pumilus (Burm.).—Rhyd-y-felin, 9.viii.; R. Ystwyth, Llanfarian, 21.viii. (L.W.G.). Aviemore, vi.-vii. (K.G.B.).

B. niger (L.).—Weeford, 6.vii. (L.W.G.).

B. rhodani (Pict.).—R. Wye, near Builth, 9.iv.; R. Ystwyth, Llanfarian, 10.viii. (L.W.G.).

B. bioculatus (L.). — R. Caldew, Raughton Head, 2-3.ix. (L.W.G.). Plessey Wood, 10.vii. (J.O.C.).
Centroptilum luteolum (Müll.). — Christian Malford, 9.v. (L.W.G.). Aviemore, vi.-vii. (K.G.B.).
Cloëon dipterum (L.). — Hoddesdon, 28.v.; Altcar, 25.vi. (L.W.G.). Milton Street, 15.v. (W.E.C.). Stroud, 15.v. (T.B.C.). Plessey Wood, 10.vii. (J.O.C.).
C. simile Etn.—Aviemore, vi.-vii. (K.G.B.).

Ecdyonuridae.

Heptagenia sulphurea (Müll.).—Bridgnorth, 22.vi. (L.W.G.). Aviemore, vi.-vii. (K.G.B.). Plessey Wood, 9.vi.; Pigden, 16.vi. (J.O.C.). R. Wey, Elstead, 2.ix. (D.E.K.).
Ecdyonurus insignis (Etn.). — Plessey Wood, 30.vi.-4.vii. (J.O.C.).
E. lateralis (Curt.).—Aviemore, vi.-vii. (K.G.B.). Llanfarian, 17.viii. (L.W.G.).
E. longicauda (Steph.).—R. Caldew, Raughton Head, 2-3.ix. (L.W.G.).
E. venosus (Fabr.).—Aviemore, vi.-vii. (K.G.B.).
Rhithrogena semicolorata (Curt.).—Weeford, 6.vii. (L.W.G.). Aviemore, vi.-vii. (K.G.B.). Pigden, 16.vi. (J.O.C.).

PLECOPTERA.

Perlidae.

Perla carlukiana Klap.—Aviemore, vi.-vii. (K.G.B.).
P. cephalotes Curt.—Aviemore, vi.-vii. (K.G.B.).
Chloroperla grammatica (Poda).—Bridgnorth, 22.vi. (L.W.G.).

Taeniopterygidae.

Taeniopteryx risi Mort.—Symonds Yat, 10.iv. (O.W.R.).

Leuctridae.

Leuctra geniculata Steph. — Llanon, 20.viii.; Llanrhystyd, 20.viii. (L.W.G.).
L. fusciventris Steph. — R. Ystwyth, Llanfarian, 1.viii.; R. Rheidol, Aberystwyth, 9.viii.; Plynlimmon, 1,400 ft., 8.viii.; Llanon, 20.viii.; Llanrhystyd, 20.viii.; Llancurig, 23.viii.; R. Castell, Pont Erwydd, 22.viii.; R. Elan, Rhayader, 22.viii.; R. Caldew, 2-3.ix. (L.W.G.).
L. hippopus Kpny.—Llanthony Abbey, 8.iv. (O.W.R.).

Nemouridae.

Nemoura variegata Oliv.—Hoddesdon, 28.v.; Marston, 9.vi.; Chelford, Redesmere, 26.vi. (L.W.G.). Milton Street, 10-15.v. (W.E.C.).
Nemurella inconspicua (Pict.).—Llangorwen, 19.viii. (L.W.G.).

TRICHOPTERA.

Phryganeidae.

Phryganea striata L.—Aviemore, vi.-vii. (K.G.B.).

P. varia Fabr.—Aviemore, vi.-vii. (K.G.B.).
P. obsoleta McL.—Aviemore, vi.-vii. (K.G.B.).

LIMNOPHILIDAE.

Limnophilus lunatus Curt.—Llangorwen, 16.viii. (L.W.G.).
L. centralis Curt.—Aviemore, vi.-vii. (K.G.B.). Llanfarian, 17.viii. (L.W.G.).
L. sparsus Curt.—Stroud, 5.vi.33, 15.vii.33 (T.B.F.). R. Ystwyth, Llanfarian, 14.viii.; Llangorwen, 26.viii. (L.W.G.).
Stenophylax permistus McL.—Stroud, 18 & 26.ix.33 (T.B.F.).
S. vibex Curt.—Isle of Wight, Niton, 12.vi.30 (T.B.F.).
Micropterna sequax McL.—Stroud, 22.vi.33 (T.B.F.).
Halesus radiatus (Curt.).—Llangorwen, 16.viii. (L.W.G.).
H. guttatipennis McL.—Stroud, 21.x.33 (T.B.F.).
Drusus annulatus (Steph.).—Llangorwen, 23.viii. (L.W.G.).

SERICOSTOMATIDAE.

Sericostoma personatum (Spence). — Redditch, 24.vii. (L.W.G.). Aviemore, vi.-vii. (K.G.B.). Pigden, 16.vi.; Plessey Wood, 4.vii. (J.O.C.).
Goëra pilosa (Fabr.).—R. Blythe, Stonebridge, 6.vii. (L.W.G.). Plessey Wood, 30.vi. - 10.vii. (J.O.C.).
Silo pallipes (Fabr.). — R. Ystwyth, Llanfarian, 1.viii. (L.W.G.). Aviemore, vi.-vii. (K.G.B.).
S. nigricornis (Pict.).—Aviemore, vi.-vii. (K.G.B.).

MOLANNIDAE.

Beraea pullata Curt.—Hoddesdon, 28.v. (L.W.G.).
B. maurus Curt.—Hinksey, 19.vi. (L.W.G.). Durham, Easington, 7.vii. (J.O.C.).

ODONTOCERIDAE.

Odontocerum albicorne (Scop.). — Llangorwen, 15.viii. (L.W.G.).

LEPTOCERIDAE.

Leptocerus nigronervosus (Retz.). — Pigden, 16.vi.; Plessey Wood, 9.vi. (J.O.C.).
L. senilis (Burm.).—Milton Street, 10.vi. (W.E.C.).
L. annulicornis Steph.—Plessey Wood, 30.vi. - 10.vii. (J.O.C.).
L. cinereus Curt.—R. Blythe, Stonebridge, 6.vii. (L.W.G.). Aviemore, vi.-vii. (K.G.B.).
L. bilineatus (L.).—Redditch, 18-24.vii. (L.W.G.).
Mystacides nigra (L.). — Oxford, 24.v.; R. Blythe, Stonebridge, 6.vii.; Redditch, 19.vii. (L.W.G.). Plessey Wood, 30.vi. (J.O.C.).
M. azurea (L.). — Bridgnorth, 22.vi.; R. Rheidol, Aberystwyth, 19.viii.; Weeford, 4.ix. (L.W.G.). Aviemore, vi.-vii. (K.G.B.).
Adicella reducta (McL.).—Llangorwen, 15.viii. (L.W.G.).

Triaenodes bicolor (Curt.). — Altcar, 25.vi. (L.W.G.). Aviemore, vi.-vii. (K.G.B.).

HYDROPSYCHIDAE.

Hydropsyche pellucidula (Curt.).—Aviemore, vi.-vii. (K.G.B.). R. Rheidol, Aberystwyth, 27.viii. (L.W.G.).

H. instabilis (Curt.).—Aviemore, vi.vii. (K.G.B.). R. Caldew, 2-3.ix. (L.W.G.).

H. lepida Pict.—Ringwood, 15.vii.30 (T.B.F.).

H. angustipennis (Curt.).—Redditch, 19-22.vii. (L.W.G.).

H. guttata Pict.—Marlborough, 15.viii.30 (T.B.F.).

PHILOPOTAMIDAE.

Philopotamus montanus (Don.).—Aviemore, vi.-vii. (K.G.B.).

POLYCENTROPIDAE.

Neureclipsis bimaculata (L.). — Chelford, Redesmere, 26.vi. (L.W.G.).

Polycentropus flavomaculatus (Pict.).—Rhyd-y-felin, 17.viii.; Llanon, 20.viii.; R. Elan, Rhayader, 22.viii. (L.W.G.). Plessey Wood, 10.vii. (J.O.C.).

P. multiguttatus Curt.—Plessey Wood, 9.vi. (J.O.C.).

P. kingi McL.—R. Ystwyth, Llanfarian, 1-16.viii.; R. Rheidol, Aberystwyth, 9.viii. (L.W.G.).

Cyrnus trimaculatus (Curt.). — Oxford, 24.v.; Bridgnorth, 22.vi; Alvechurch, 22.vii. (L.W.G.). Aviemore, vi.-vii. (K.G.B.). Plessey Wood, 10.vii. (J.O.C.).

PSYCHOMYIIDAE.

Tinodes unicolor (Pict.).—Easington, 7.vii. (J.O.C.).

Lype phaeopa (Steph.).—Oxford, 24.v. (L.W.G.).

RHYACOPHILIDAE.

Rhyacophila dorsalis (Curt.). — R. Caldew, Raughton Head, 2-3.ix. (L.W.G.).

Glossosoma vernale (Pict.). — R. Rheidol, Aberystwyth, 9, 27.viii.; Llangorwen, 26.viii.; R. Caldew, Raughton Head, 2-3.ix. (L.W.G.).

Agapetus fuscipes Curt.—Redditch, 19-24.viii.; Llangorwen, 16 and 23.viii. (L.W.G.).

A. comatus (Pict.).—Aviemore, vi.-vii. (K.G.B.). Llangorwen, 15.viii. (L.W.G.).

HYDROPTILIDAE.

Agraylea pallidula McL.—Stanmore Common, 9.vi. (K.G.B.).

Ithytrichia lamellaris Etn.—Weeford, 6.vii. (L.W.G.).

Hydroptila occulta Etn.—Weeford, 6.vii. (L.W.G.).

D. E. KIMMINS (*Dept. of Entomology, British Museum, Nat. Hist.*).

The house sparrow preying on Lepidoptera.

In May, 1933, I observed a female sparrow fly into an apple tree and take an imago of *Pieris rapae* Linn. which was resting among the leaves. The bird then ate all the insect with the exception of the wings.

In August, 1934, I disturbed a *Graphiphora pronuba* Linn. from a hedge during the day. On flying off it was seized by a sparrow, which then flew into a tree and killed the moth by beating it against a branch. S. C. Scarsdale Brown.

Euphydryas aurinia Rott. (Lep.): flying powers.

To the records relating to the wandering habits of this insect given in 1934, *J. Soc. Brit. Ent.*, **1** (2): 29-30, may be added the following:

One male on 22nd May, 1922, at Badbury Rings, near Wimborne, Dorset.

I have worked this locality for some years, before and since this date, and I have never seen or heard of any further captures. The nearest locality frequented by *E. aurinia*, of which I am aware, is eight miles due west.

S. C. Scarsdale Brown.

Nonagria sparganii Esp. (Lep.) in Hampshire.

This year I found the pupae of this species in the stems of *Typha* in two Hampshire localities — the New Forest and at Christchurch. With the exception of the Isle of Wight, there appears to be only one other record for the county (*vide* W. Fassnidge, 1924, 'List of the Macro-lepidoptera of Hampshire and the Isle of Wight,' *Ent. Rec.*, **36** (Suppl.): 18).

S. C. Scarsdale Brown.

Ourapteryx sambucaria Linn. (Lep.): double-brooded.

At Bournemouth, on the 19th October, 1934, I took a fresh specimen of *Ourapteryx sambucaria* Linn. at light. R. South (1908, 'The Moths of the British Isles,' London, **2**: 282) mentions one taken at Gravesend on 22nd October, 1904.

S. C. Scarsdale Brown.

Two new records of Metopius dentatus Fabr. (Hym., Ichneumonidae).

This is such a fine and conspicuous insect as not easily to be overlooked by any entomologist, so that fresh records of it may well be of general interest.

Among some Ichneumonidae from South Haven Peninsula, Studland Heath, Dorset, submitted to me for determination by Capt. C. Diver was a female of this species (East Heath Pine

Belt, 9.vi.33). A female of the northern variety var. *interruptus* Thoms. was bred by Mr. P. Brodie from a larva of the usual host, *Lasiocampa quercus* Linn., var. *callunae* Palm., taken in Skye in August, 1932; the parasite emerged 10.v.33.

The former specimen is deposited in Capt. Diver's Studland Heath type collection, the latter in the Cambridge University Museum of Zoology.

References.

Clément, E. 1930 (1929). Opuscula Hymenopterologica, III. Die Palä-arctischen *Metopius*-Arten (Hym., Ichneumon.). *Konowia*, **8**: 325–437.

Morley, C. 1911. British Ichneumons. London. **4**: 3–5.

G. J. Kerrich.

Mortality in the dung-fly, Scatophaga stercoraria Linn. (Dipt., Cordyluridae).

On 22nd April, 1933, a large number of dead *Scatophaga stercoraria* were noticed on the flowering heads of hedge parsley (*Caucalis Anthriscus* Huds.) which partly filled an orchard at Kidlington, four miles north of Oxford. The dead flies had conidia or fructifications of a fungus protruding from the body. Several dying flies showed a greatly distended abdomen with white below between the segments, but without any conidia, which only developed later. Dr. T. Petch reports that the sample specimens submitted to him had all been attacked by the same fungus, *Empusa muscae* Cohn., and adds: 'I had a similar experience in east Yorkshire in 1931. I find this fungus frequently on flies in the field.' The flies died in a characteristic attitude with the wings outspread, and they were found clinging rather tightly to the flower-heads. They were twice found on the leaves, and occasionally on the heads of grass (*Dactylis*). Over eighty *Scatophaga* were collected in a comparatively short time, so that it may be assumed that at least several hundred deaths occurred within a week or two in an area of about an acre. At this time only a few living ones were to be seen in the orchard. Deaths were noticed for some weeks afterwards, but the mortality appeared to have ceased by mid-summer. Of thirty flies identified, nine were males and twenty-one females. Mortality in *Scatophaga* was not confined to Kidlington. Mr. H. M. Edelsten sent us specimens of *S. stercoraria* (thirteen males, twenty females) taken at Pevensey in Sussex on 11th June, 1933. He writes: 'I found a large patch of nettle, every shoot of which was covered with numbers of dead dung-flies. There must have been many thousands on this one patch. . . I have noticed them before, but never in such immense quantities.' Similar epidemics to that at Kidlington occurred about the same time at Iffley, Oxon, and Kennington, Berks (both within two miles of

Oxford), the dead flies being especially numerous on the heads of hedge parsley and of grasses. A dead male was found at an altitude of about 2,500 feet in the Lairig Ghru, between Aviemore and Braemar, Inverness-shire, 22nd June, 1933. A few living specimens of the species were seen in the same locality, but the weather was cold and showery and most insects had taken shelter, so that it was impossible to estimate the abundance of *S. stercoraria* in the community. At Wetherby, Yorks, 13th July, 1933, numerous dead individuals were found on Umbelliferous flower-heads, in much the same way as those previously observed at Kidlington. The species was very abundant, and of the nine specimens examined, four were males and five females.

It seems that mortality, apparently caused by a parasitic fungus, was widespread in this one species of *Scatophaga* in 1933, and that in two places at least (Kidlington, Oxon, and Pevensey, Sussex) it was unusually severe in that year. With regard to the mode of infection, A. Paillot (1933, 'L'infection chez les insectes,' Trevoux: 72) states that Roubaud has artificially infected *Stomoxys calcitrans* Linn., *Musca domestica* Linn. and various species of *Glossina* with *Empusa muscae*, and that these experiments showed infection to occur generally through the gut. He also notes that Hesse confirmed these results and succeeded in infecting house-flies by making them feed on sugar solution containing zygospores (resting spores) of the fungus. The spores germinated and gave rise to a conidium-bearing mycelium. Hesse produced infection both in the larvae and the adults (Paillot, p. 437).

Sample specimens of *Scatophaga* from some of these epidemics are deposited in the Hope Department at Oxford University Museum. B. M. Hobby and Charles Elton.

Butterflies of the Somerset-Dorset border country in 1934.

The country within a few miles of Yeovil lies partly in Somerset and partly in Dorset. The land is mainly undulating, fertile, well-wooded, interspersed with high down country and not intensively cultivated. From the collector's point of view the district, though not exceptional, is probably of more than average interest.

During the collecting-season of 1934 the following observations were made of the butterflies of the district, the nomenclature being that of F. Hemming, 1934, 'The generic names of British Insects,' London, Part 2.

Pararge aegeria Linn.—Abundant throughout the season.
P. megera Linn.—Abundant in May and July.
Satyrus galathea Linn.—A few specimens observed in one wood during July.

Eumenis semele Linn.—Observed in one locality.

Maniola tithonus Linn., *M. jurtina* Linn. and *Coenonympha pamphilus* Linn.—Abundant throughout the district.

Aphantopus hyperanthus Linn.—Common in several localities.

Argynnis selene Schiff.—Fairly common in some woods.

A. euphrosyne Linn.—Common in all woods.

A. aglaia Linn.—Common in suitable localities.

A. cydippe Linn.—Not common, but a few specimens were observed in one locality.

A. paphia Linn.—Fairly common in the larger woods. The var. *valesina* Esper was not observed in 1934.

Euphydryas aurinia Rott. — A very strong colony near Yeovil has been under observation for several years. During March, 1934, an extensive fire appeared to have devastated the whole area. It was very pleasing to observe that the species survived and appeared as usual in its favourite spot, though in enormously reduced numbers. This suggests the possibility that in 1933 some insects must have strayed some distance from the main colony and laid their eggs. Scabious is to be found throughout the whole district.

Vanessa atalanta Linn. — Common in the district, but not observed in 1934 before July.

V. cardui Linn.—A few specimens were observed in June.

Aglais urticae Linn.—Common everywhere from the beginning of April onwards.

Nymphalis io Linn.—Observed constantly from 8th April onwards. This species was more abundant in 1934 than *V. atalanta* Linn.

Polygonia c-album Linn. — During May the species was fairly common, but was not nearly so common in the autumn.

Hamearis lucina Linn.—This butterfly is to be found in one restricted locality, but is not common. It appeared in about the usual numbers in 1934.

Polyommatus icarus Rott.—Occurred abundantly everywhere.

Lycaena phlaeas Linn. — Observed constantly throughout the season.

Callophrys rubi Linn.—Found in small numbers in one locality. So far this butterfly has only been found on one stretch of heath in the district, and has never been seen in any numbers.

Leptidea sinapis Linn.—Two strong colonies have been found in the district, one of which appears to be mainly the var. *lathyri* Hübn. A second brood appeared in 1934 for the first time during the four years which the colonies have been observed.

Pieris brassicae Linn.—Common.

P. rapae Linn., *P. napi* Linn., *Euchloë cardamines* Linn., *Gonepteryx rhamni* Linn., *Erynnis tages* Linn., *Syrichtus malvae* Linn., *Adopoea sylvestris* Poda, and *Ochlodes venata* Brem. & Grey.—Abundant.

This gives a total of thirty-three species, all of which are to be seen every year within the small area. The total is reduced by the fact that of the 'Blues' only *Polyommatus icarus* Rott. has so far been found. The district would appear to be suitable for *Lycaenopsis argiolus* Linn., but the species has not yet been seen. *Plebejus argus* Linn. also appears to be absent, although it is so common in the eastern districts of Dorset. The woodland species are well represented, as might be expected. The migrant *Colias croceus* Fourc., has not yet been noticed, though it occurs on the coast fifteen miles away. E. L. Crossley.

Ephemeroptera in the Lake District.

During 1931 (10th-16th July), I spent a few days in the Lake District. My collecting was almost entirely restricted to the mayflies, and a list of the species captured is given below. Short visits in May and August — September, 1931, and again in September, 1932, were devoted to other insects, but a few Ephemeroptera were noted and are included in the list.

When adults were not on the wing, as on the occasion of my visit to Crummock and Buttermere (16.vii.31), spiders' webs proved a happy hunting-ground and at least one species (*Caenis halterata*) which was normally over was taken in this way, though naturally the material was not in good condition.

The localities visited were as follows:

(1) Grasmere Lake (Westmorland), 11.vii.31, 31.viii.31.
(2) River Rothay and small tributary at foot of the Helm about one mile N. of Grasmere (Westmorland), 11.vii.31, 14.vii.31.
(3) Easedale Gill, near Grasmere (Westmorland), 11.vii.31.
(4) River Rothay, N. end of Rydal Water (Westmorland), 13.vii.31.
(5) Vale of St. John (Cumberland), 12.vii.31, 13.vii.31.
(6) Penruddock (Cumberland), 13.vii.31.
(7) Great Langdale (Westmorland), 14.vii.31.
(8) Bassenthwaite Lake, N. end (Cumberland), 12.vii.31.
(9) Near Lorton (Cumberland), 16.vii.31.
(10) Crummock Water, near Hause Point (Cumberland), 16.vii.31.
(11) Buttermere Lake, S. end (Cumberland), 16.vii.31.
(12) Seascale (Cumberland).
(13) Wasdale Head, Mosedale Beck at foot of Black Sail (Cumberland), 20.ix.32.
(14) Newby Bridge (Lancashire), 25.v.31.
(15) River Eamont, near Pooley Bridge (Westmorland), 13.vii.31.

List of Species.

The signs ! and ! ! are used to denote respectively common and abundant.

Ephemeridae.

Ephemera danica Müll., 1764.—(8) !

Ecdyonuridae.

Heptagenia lateralis (Curt., 1834).—(1) 11.vii.31 ; (2) 11.vii.31 ! ; 14.vii.31 ; (5) 12.vii.31 ! ; 13.vii.31 !

Ecdyonurus venosus (Fab., 1775).—(2) 14.vii.31 ; (5) 12.vii.31 ; 13.vii.31.

Ecdyonurus sp.? —(13) Nymph. Probably a new species to the British list, see later note.

Rhithrogena semicolorata (Curt., 1834).—(2) 11.vii.31 ; (9) ; (11).

Siphlonuridae.

Siphlonurus lacustris Eaton, 1870.—(7) 1 ♀, subimago.

Baëtidae.

Baëtis vernus Curt., 1834.—(15).

Baëtis rhodani (Pict., 1845).—(12) ; (14).

Baëtis scambus Eaton, 1870.—(13).

Baëtis pumilus (Burm., 1839).—(5) 13.vii.31 ! ! ; (8).

Centroptilum luteolum (Müll., 1776).—(1) 31.viii.31 ; (8) ; (10).

Cloëon simile Eaton, 1870.—(8).

Cloëon rufulum (Müll., 1776).—(10).

Ephemerellidae.

Ephemerella ignita (Poda, 1761).—(1) 31.viii.31 ; (2) 14.vii.31 ! ! ; (3) ; (4) ; (5) 13.vii.31 ! ! ; (6) ! ! ; (11) ! !.

Ephemerella notata Eaton, 1887.—(10) 1 ♂.

Caenidae.

Caenis hulterata (Fab., 1777).—(10). W. D. Hincks.

Preliminary note on a probable addition to the British list of Ephemeroptera.

The purpose of the present note is to draw attention to the possibility of an addition to the British Ecdyonuridae. Unfortunately the adult insect has so far eluded us, so that we are not justified in adding the species to the list. We have, however, seen the nymph on several occasions, and perhaps now that attention has been drawn to it collectors with more time and better facilities than ourselves will be able to obtain the adult.

The first nymph taken was the example referred to by one of us in the foregoing note as *Ecdyonurus* sp. and was taken under a stone in the Mosedale Beck, Wasdale Head, on 20th September, 1932. The occasion of the visit to Wastdale was an afternoon motor run from Seascale, so that only a very short time was available for collecting. No more nymphs of this species were found on this occasion, but it is believed that an undoubted Ecdyonurid just too high to be captured was an adult of this species. It is a great pity that on this one afternoon the fly net was left at home.

We believe we have taken the same nymph at Scarcroft, near Leeds, several years ago, but unfortunately the specimen is not now available. Several young examples were taken from the River Skell near Ripon in August, 1933, and Mr. John Wood has sent us specimens from the Keighley district. Mr. J. M. Brown has captured the same nymph in the Sheffield district and in Derbyshire.

The figure here given (Pl. I) is taken from the Wastdale example and is presented with the wing rudiments somewhat shortened to render the yellow basal abdominal segments visible. It will be seen that the figure agrees closely with that given by E. Schoenemund (1930, 'Die Tierwelt Deutschlands,' **19** Teil: 'Ephemeroptera,' 84, f. 142) for *Ecdyonurus forcipula* (Pict.), and we believe it is to this species that our material must be referred.

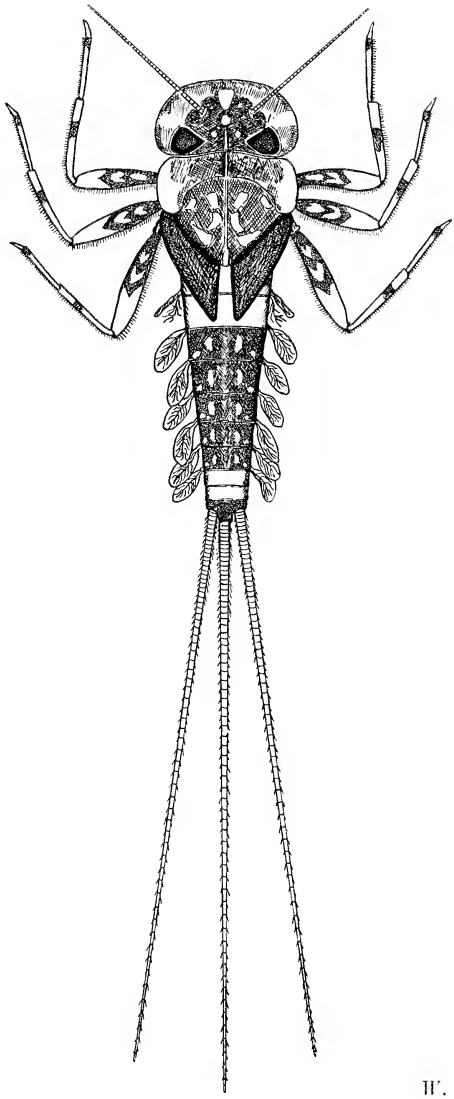
Details of the adult may be found in the above-quoted work of Schoenemund (p. 23, f. 28); in A. E. Eaton, 1883—1888, 'A Revisional Monograph of recent Ephemeridae or Mayflies,' *Trans. Linn. Soc. Lond.*, Zool. (2) **3**: 286, t. XXIV, f. 46 c; and in G. Ulmer, 1929, 'Die Tierwelt Mitteleuropas, Insekten I,' **3**: 32, f. 120.

We hope those interested in the Ephemeroptera will keep a look-out for the adult, examining with care all smaller specimens of *Ecdyonurus* (Eaton) Schoenemund, and particularly small examples of presumed *E. venosus* (Fab.) and *E. longicauda* (Steph.). W. D. Hincks and J. R. Dibb.

Coleoptera attracted to light.

Dr. Hugh Scott and others have reported from time to time (*vide* 1927, *Ent. Mon. Mag.*, **63**: 90; 1930, **66**: 232-3, 256, 257, 279) the occurrence of certain species of Coleoptera attracted to light. During the summer of 1931, whilst taking moths by the simple method of leaving my study window wide open when working there during fine evenings with the electric light on, two species of Coleoptera occurred — *Cantharis nigricans* Müll. (two specimens on the evening of 10th June, 1931) and *Aphodius rufipes* L. (on several occasions throughout the summer). The latter species has been recorded many times at light, but I cannot recall the occurrence of the former species. My attention was drawn to the *Cantharis* by hearing the elytra vibrating against the electric light bulb. After a few seconds the insect flew from the light to a far corner of the room and did not subsequently appear to be attracted close to the light. The second specimen appeared within a few minutes of the first and acted in exactly the same manner. John R. Dibb.

PLATE I.



W. D. Hincks del.

ECDYONURUS SP.: A PROBABLE ADDITION TO THE BRITISH LIST OF EPHEMEROPTERA.

An entomologist's collecting case.

It was some years ago when the question of a new type of entomologist's collecting case was first discussed with my friend and colleague Mr. W. D. Hincks. We drew up several designs before finally deciding upon the one which was eventually chosen, in the hope that our specialised requirements in the field would be provided for. Cases following the specification detailed below have now been in constant use by Mr. Hincks and myself during the past four years, and as they have fully justified our expectations and proved of invaluable assistance to us upon our collecting expeditions, we thought that some other entomologists might welcome a new suggestion in this connection.

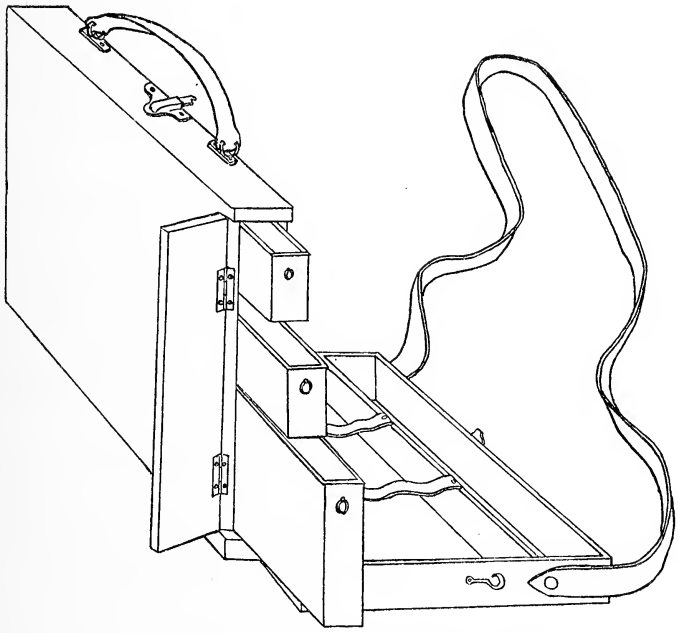


Fig 8. — An entomologist's collecting case.

This case has been designed to hold, so far as possible, all the requirements of the entomologist in the field. Its general appearance is something like a small attaché case with a fairly deep 'lid.' The main bulk is taken up by six sliding specimen tube holders in the form of drawers. Three of these drawers are fitted into each end of the case. Each of the top drawers contains sixteen small, corked, flat-bottomed specimen tubes, fitted in the manner of a test tube stand, the middle drawers contain

five tubes of a larger size, and the lowers drawers four large tubes. This arrangement provides for fifty specimens separately tubed, but as it is not usually necessary to bring home all living specimens, some of the largest tubes (size 1 inch by 3 inches) can be used as killing bottles, containing laurel, cyanide, etc., as desired. When the drawers are closed a hinged shutter is closed over them and fastened with a small catch. If it is desired to take an extra large bottle, one of the lower specimen drawers may be taken out completely and left at home, the bottle being placed in the cavity and kept in by closing the hinged shutter which covers all the drawer apertures at that end of the case.

Apart from a few fittings, the whole case is made of wood, three-ply wood being used for the drawers and inside partitions, and the over all measurements are approximately 13 by 10 by 5 inches. In the 'lid' a shelf is placed 3 inches from the top, forming two cavities therein, the upper one 3 by 12 by $1\frac{1}{2}$ inches and the lower one 5 by 12 by $1\frac{1}{2}$ inches. In the latter are placed sweeping net, butterfly net and small pond ring, all folded up, together with other apparatus, this being held in by means of two transverse leather straps; the former division can take small boxes, tins, etc. A strong leather shoulder strap is attached to the ends of the case, and in addition a leather handle on top.

One of the greatest advantages of this case is that in the act of collecting, both hands are free, with the strap over one shoulder and the case slung upon the other side, according to which set of tube drawers are in use. If the drawers are made to fit tightly, the one in use can be left half open exposing a number of specimen tubes, which are available as easily and quickly as required whilst specimens are being captured. It will be apparent that in order to slide out the specimen tube drawers it is not necessary to open the case, the two sides being kept together by means of a small strong clasp upon the top.

The main drawback of a case of this description is that it is necessarily of considerable weight, as all apparatus is contained in comparatively little space, so that it behoves the constructor to use wood which is light and strong, but at the same time as thin as possible. The outside of the case should be painted a dark colour according to choice. Almost any joiner would construct it, and the cost should not exceed twenty-five shillings. The strap and handle is best fitted by a leather worker at a slight additional cost. The outlay does not seem to be excessive when it is realised that the case will last a lifetime.

An alternative would be to have the case made up in japanned metal, and this would have the advantage of reducing the weight; on the other hand, a japanned metal case would quickly overheat in the sun, and the cost would be considerably increased.

We should be glad to supply anyone interested with more precise details if required. JOHN R. DIBB.

Female of Platychirus melanopsis Loew (Dipt., Syrph.) in Inverness-shire.

The female of this mountain species having proved so elusive to collectors in the past, it was very gratifying to capture one on flowers of ragwort at Feshie Bridge, Inverness-shire, on 1st July, 1933. Verrall (1901, 'British Flies,' London, **8**: 273-4) took a male at Rannoch on 20th June, 1870, while he met with numbers of that sex at Ullswater on 15th July, 1876, and again on 25th June, 1887. He failed to find the female, however, and described the sex from a single specimen taken at Braemar in 1871 and sent to him by Dr. Buchanan White. The widened abdomen, peculiar to the female, combined with the large reddish-yellow markings, distinguish it from all other British species of *Platychirus*. RALPH L. COE.

Botys nubilalis Hübn. (=lupulinalis Guen.) (Lep.) in the Isle of Wight.

I took a specimen of this species at light in my garden at Alverstone, Isle of Wight, on 6th July, 1934. Dr. K. G. Blair has kindly confirmed the identification and supplied the following information:

(1) In the British Museum (Natural History) there are two specimens from the Mason collection; one of these is labelled 'Ventnor, Mr. Tuck.' In the Eustace Bankes collection there are three specimens, each labelled 'Near Sandown, Dr. A. Wallace cepit circa 1857, Ent. Ann. 1857, 118 (= silacealis), Ent. Wk. Int. V (1858) 92.'

(2) The references are to:—

(*a*) A list of 'Rare British species captured in 1856,' which mentions three specimens taken by Mr. Wallace on Culver Cliffs, Sandown—presumably the three in the Eustace Bankes collection.

(*b*) An article entitled 'Notes on Lepidoptera observed in the Isle of Wight in 1857 and 1858' by 'A Vectisian,' which says, '*Botys lupulinalis*. At light in June; about twenty specimens,' but gives no locality.

H. T. Stainton, 1859, 'A manual of British butterflies and moths,' London, **2**: 148, calls it *lupulina* and records it from Manchester and Sandown, I.W.

J. H. Leech, 1886, 'British Pyralides,' London: 32, gives the Isle of Wight and the south of London as localities.

E. Meyrick, 1895, 'A handbook of British Lepidoptera,' London: 416, probably collating the records of Stainton and

Leech, says, 'Middlesex, I. of Wight, Lancashire, probably a casual immigrant only.'

The Manchester locality, now eighty years old, seems more than dubious, while the references to the neighbourhood of London I suspect to be due to a confusion between Sandown Park in Surrey and Sandown, I.W. I do not think it is a casual immigrant, since at least twenty-three were taken between 1856 and 1858 and it has never been reported from the coasts of Kent, Sussex, etc. The reason it has not been reported in recent years is that entomologists who collect in the south of the Isle of Wight are nearly all summer visitors who are not there by the first week in July, while no one has collected in the interior of the eastern half of the island. The larva of *B. nubilalis* feeds in the stems of hop, which grows more abundantly in the hedges of the interior than near the coast. However, the fact that *B. nubilalis* is a resident can only be proved by the capture of more specimens. E. A. C. Stowell.

Some breeding records of Diptera.

On 9th Aug., 1933, I investigated a nest of *Vespa rufa* L. at Slough, Bucks, that had been destroyed with chemicals a month before. In the nest were twenty-four large Dipterous puparia. Twenty-one of these gave rise to eleven male and ten female *Muscina pabulorum* Fall.; two of them failed to emerge, and the last, on 19th Aug., produced a large white larva, which was certainly that of an *Aleochara* (Staphylinidae). Unfortunately it died, so that the species is undeterminable, but judging by its size (8 mm. long) it cannot have been any of the species of *Aleochara* whose habits have previously been recorded.

On 1st Sept., 1933, Mr. F. J. Griffin gave me part of an old cherry tree from Hampton, Middlesex, containing nests of *Crabro* (*Coelocrabro*) *leucostomus* L. The following flies were bred from puparia found in the cells:—*Ptychoneura cylindrica* Fall., male emerged 26th March, 1934, female 23rd June to 9th July, 1934; *Macronychia polyodon* Mg., male emerged 14th May, 1934. The Chalcid, *Habritys brevicornis* Ratz., was also present. It is a well-known parasite of the genus *Crabro*.

Two larvae of *Acronycta aceris* L. were found on a cultivated species of *Acer* at Slough on 22nd Aug., 1933. Both produced males of *Compsilura concinnata* Mg., on 14th and 25th May, 1934, respectively. In my experience, *A. aceris* is particularly liable to the attacks of this Tachinid.

A spun larva of *Plusia* sp. was found on *Calluna* at Torridon, Ross-shire, 5th July, 1934. Two males of the polyphagous *Phryxe vulgaris* Fall. emerged 16-19th July, 1934.

The species of *Actia* are known to parasitize various Lepidoptera. A puparium of *A. crassicornis* Mg. was found lying

free on a leaf of *Angelica* near George Green, Bucks, 30th May, 1934; a male emerged 3rd June, 1934. Presumably the Tachinid larva had failed to reach the ground before it was overtaken by pupation. O. W. Richards.

Some breeding records of Hymenoptera.

1. Parasites of Depressaria heracliana De G. (Lep., Tineina).

Pupae of this moth may often be found abundantly inside the stems of *Heracleum sphondylium* L.; this was especially the case in the summer of 1933, when forty-nine pupae were collected in the grounds of the Imperial College Field Station, Slough, Bucks, on 29th July, 1933. The following insects were bred:

D. heracliana De G.—2 ♀♀, 11th Aug.; 1 ♀, 12th Aug.; 1 ♀, 13-14th Aug.; 1 ♀, 21st Aug.

Barichneumon heraclianae Bridgm.—1 ♂, 29th July; 1 ♀, 7th Aug.; 1 ♀, 8th Aug.; 1 ♂, 9th Aug.; 2 ♀♀, 28th Aug.

Pimpla similis Bridgm. (det. Mr. J. F. Perkins).—3 ♀♀, 1 ♂, 29th July; 1 ♀, 3rd Aug.; 1 ♀, 4th Aug.

Psychophagus omnivorus Walk.—(Emerging from the moth-pupae); 21 ♀♀, 1 ♂, and two broods which together made 44 ♀♀, 10th Aug.; 18 ♀♀, 1 ♂, 11th Aug.; 14 ♀♀, 6 ♂♂, and 10 ♀♀, 2 ♂♂, 1 sex indet., 12th Aug. One female of this species also emerged 22nd Aug. from a chrysalis containing a *Barichneumon*. *P. omnivorus* is well-known to be a facultative hyperparasite.

Dibrachys cavus Walk. (= *boucheanus* Ratz.).—(Emerging from moth-pupae); 11 ♀♀, 3 ♂♂, 19th Aug.; 12 ♀♀, 1 ♂, 26th Aug.; 9 ♀♀, 2 ♂♂, 29th Aug.; 9 ♀♀, 2 ♂♂, 30th Aug. Two further broods (15 ♀♀, 2 ♂♂, 28th Aug. and 4 ♀♀, 1 ♂, 4th Sept.) emerged from two puparia of *Nemorilla floralis* Mg., a parasite of the larva. Two females also emerged from a cocoon, almost certainly that of a Campoplegine, found amongst the moth-pupae.

Pezomachus sp.—One female emerged from a pupa on 14th Aug.

The remaining twenty pupae dried up. Of parasites which attack the larva, or at least emerge from earlier instars than the pupa, the following were found; they were lying loose in the *Heracleum* stems amongst the moth-pupae and may be taken with a high degree of probability to have emerged from larvae.

Nemorilla floralis Mg.—Two puparia of this species, as already mentioned, were parasitized, but a third produced a male, 13-14th Aug.

Microgaster sp.—An empty cocoon, which I ascribe to this genus, was found in the stems.

? *Litomastix phalaenarum* Thomson. — The polyembryonic Chalcids of this genus produce, finally, an unmistakable effect on the host. The larva becomes very much blown out and, when the parasites have emerged, the inside is seen to be divided into numerous compartments by membranous divisions. Twelve such larvae were found. Thomson described a species (*L. phalaenarum*) from this host, and it is possible that Thomson's species had attacked and already emerged from the larvae I found.

A hyperparasitized species of a Campoplegine has already been mentioned. In 1934 the species was very much rarer. On 26th July, 1934, eight pupae were found. These produced a moth (2nd Aug.) and three male and four female *Barichneumon*, 3rd-9th Aug. An Anthomyiid, *Phaonia trimaculata* Bché. (det. Mr. J. E. Collin), was a scavenger in the larval débris, as also was *Fannia* sp. (not bred).

2. Parasite of Odonestis potatoria L. (Lep., Lasiocamp.)

A cocoon of this moth was found on the moors at Lienassie, Ross-shire, 29th June, 1934. A female of *Ichneumon crassorius* Steph. emerged 16-19th July, 1934. This *Ichneumon*, kindly determined for me by Mr. J. F. Perkins, is probably only a dark form of *I. didymus* Wesm.

3. Parasites of Abraxas grossulariata L. (Lep., Geom.).

Material of this species was collected at Slough, 12th June, 1934, on bushes of *Euonymus japonica* Linn. Five half-grown larval corpses were attached to cocoons of *Trophocampa vidua* Gr. These produced 1 ♂, 14th June; 2 ♂♂, 16th June; 1 ♀, 18th June; while one larva died in its cocoon. One nearly full-grown larva of *Abraxas* produced a brood (12 ♀♀, 7 ♂♂) of *Apanteles limbatus* Marsh. Eleven *Abraxas* pupae produced three moths and 3 ♀♀, 5 ♂♂ of *Stenichneumon trilineatus* Gmel., between 22nd June and 9th July. A number of empty cocoon masses of *Microgaster alvearius* L. were seen on the branches and may well have emerged from the caterpillars of *Abraxas*.

4. Parasite of Asphalia flavicornis L. (Lep., Cymatophor.).

A larva almost certainly of this species was found under a slight web on a birch leaf at Bagshot, Surrey, 8th June, 1934. By 12th July, a Hymenopterous larva had emerged after destroying its host almost completely. On the 16th July a male of *Labrorrhychus flexorius* Thunb. (= *tenuicornis* Gr.) (identification confirmed by Mr. J. F. Perkins) emerged. Dr. E. A. Cockayne was kind enough to suggest the identity of the larva from my description.

5. A Parasite of a Tortricid (Lep.).

A very fat grey and black Tortricid larva was found on cherry laurel at Slough, 2nd June, 1934. Between 23rd June and 9th July, 33 ♂♂ of the Braconid, *Macrocentrus abdominalis* Fab., emerged.

6. Some Lepidoptera on apple.

On 4th May, 1934, some of the apples at the Imperial College Field Station at Slough were seen to have many of the young leaves spun together. It was hoped that a collection of the larvae involved might be found to consist chiefly of one species of Tortricid, but, as it turned out, there were a number of species and the hosts of the parasites remained uncertain.

Moths bred from apple shoots collected 4th May: — 24th May, *Cacoecia lecheana* L.; 1st June, *Argyresthia cornella* F. and *Chloroclystis rectangulata* L.; 2nd June, *A. cornella* and *C. rectangulata* L.; 3rd-4th June, *A. cornella*, 1 ♀, *Argyroploce pruniana* Hb., 2 ♂♂, and *Pandemis ribeana* Hb., 1 ♂; 6th June, *A. pruniana*, 1 ♀; 7th June, *A. pruniana*, 1 ♂, 1 ♀; 11th June, *A. pruniana*, 1 ♀; 12th June, *A. pruniana*, 1 ♀, and *P. ribeana*, 1 ♀; 18th June, *Spilonota ocellana* F., 1 ♂.

The following parasites emerged: — 23rd May, *Apanteles xanthostigma* Hal., 2 ♀♀, and *Meteorus confinis* Ruthé, 1 ♂ (confirmed by G. E. J. Nixon); 15th June, *Macrocentrus thoracicus* Nees, 1 ♀.

7. A parasite of Apion loti K. (Col., Curc.).

The above beetle may be bred not uncommonly from the pods of *Lotus* spp. A collection of one hundred and twenty-three more or less ripe pods made at the Fire Hills, Hastings, Sussex, 16th Sept., 1933, produced, besides the beetles, a Pteromalid parasite which I have identified as *Trichomalus irus* (Walker, 1839). The clue to its identity is found in a paper by G. Mayr (1903, *Verh. k.k. zool.-bot. Ges. Wien*, **53**: 387-403), who bred this species from somewhat swollen pods of *Lotus corniculatus* L. near Vienna; he states that the pods contained an orange Cecidomyid larva, but *Apion* may have been present as well (*Trichomalus* seem normally to attack Coleoptera). Mayr examined the type of *Pteromalus vagans* Förster (1841) and paratypes of Walker's species and of *Trichomalus pedicellaris* Thomson (1878). According to Mayr all these species are synonymous. I have compared my specimens with Walker's type males and consider they are the same species. The emergences were as follows: — 123 pods collected 16th Sept., 1933: 16th Sept., 3 *A. loti*; 18th Sept., 1 ♀ *T. irus*; 22nd Sept., 2 *A. loti*; 23rd Sept., 2 *A. loti*; 25th Sept., 2 *A. loti*; 27th Sept., 2 *A. loti*; 28th Sept., 6 *A. loti*; 30th Sept., 10 *A. loti* and 1 ♀ *T. irus*; 2nd Oct., 3 *A. loti*; 4th Oct., 7 *A. loti* and 2 ♂

T. irus; 6th Oct., 1 ♂, 1 ♀ *T. irus*; 11th, Oct., 1 *A. loti* and 1 ♀ *T. irus*.

A collection of pods of *Lotus uliginosus* Schk. made at Slough in Sept., 1933, produced nothing but some numbers of the beetle. However, in Aug., 1934, a plant of the same species at Slough was brought indoors in a pot to feed the larvae of *Polyommatus icarus* Rott. One male of *T. irus* emerged on 23rd Aug., but none of the beetle.

8. A parasite of Apion apricans Hbst. (Col., Curc.).

On 4th Oct., 1933, a number of heads of clover (*Trifolium pratense* L.) were collected at Slough, to breed out the clover-seed Chalcid. A specimen of the above beetle, a well-known clover-pest, emerged on 11th Oct. On 2nd Feb., 1934, a female of *Pseudotorymus apionis* (Mayr, 1874) emerged. This parasite was bred by Mayr from the same species of *Apion* which was doubtless the host in the present case.

9. Parasites of Scolytus mali Bech. (Col.).

Mr. F. J. Griffin gave me some cherry twigs colletced in his garden at Hampton, Middlesex, on 20th Sept., 1933. These produced large numbers of the above Scolytid and also the following Chalcids:—27th Sept., *Rhaphitelus maculatus* Walk., 2 ♂♂, 2 ♀♀; *R. maculatus*, 1 ♂, 1 ♀; 29th Sept., *R. maculatus*, 3 ♂♂; 4th Oct., *R. maculatus*, 2 ♂♂, 3 ♀♀; 6th Oct., *R. maculatus*, 2 ♀♀; 11th Oct., *R. maculatus*, 1 ♀; 14th Oct., *R. maculatus*, 3 ♀♀; 6th Nov., *R. maculatus*, 2 ♀♀; 9th Feb., 1934, *R. maculatus*, 4 ♂♂, 1 ♀; 20th April, *Cheiropachys colon* L., 2 ♀♀; 27th April, *C. colon*, 4 ♀♀, and *R. maculatus*, 1 ♂; 1st May, *Eurytoma ischioxanthus* Ratz., 1 ♀; 14th May, *R. maculatus*, 1 ♂, and *E. ischioxanthus*, 1 ♂.

The specimens of the *Eurytoma* are unusually small and its specific characters are not very well shown. I think the identification is correct and the nature of the host supports this view.

10. A new British species of Doryctes (Hym., Braconidae).

Mr. F. J. Griffin, at the same time as he gave me the cherry twigs just alluded to, gave me some apple twigs, collected on 8th Sept., 1933. A small number of *Scolytus mali* Bech. emerged from these too, and also four specimens of *Tetrops praeusta* L., but no Chalcids. Between 23rd June and 9th July, 1934, 2 ♀♀ and 1 ♂ of *Doryctes undulatus* Ratz. emerged (confirmed G. E. J. Nixon). T. A. Marshall (in E. André, 1888, 'Spéc. Hym.,' **4**: 'Braconidae I,' 237) records this parasite from France, and gives as host the Longicorn *Pogonochoerus hispidus* L. It is probable that *T. praeusta* was the host in my material.

11. Trichogrammatid (Hym.) parasites of weevils.

A collection of birch leaves rolled by *Rhynchites betulae* L. was made at Stoke Green, Bucks, on 2nd June, 1934. On 18th June, 2 ♀♀ of *Ophioneurus signatus* Ratz. emerged. In the British Museum collection are two females taken in company with the same host at Bracknell, Berks, 16th July, 1931, by Capt. A. K. Totton. A collection of oak leaves rolled by *Attelabus nitens* Scop. was made at Bagshot, Surrey, 3rd June, 1934. Between 23rd June and 9th July, 7 ♂♂ and 13 ♀♀ of *Poropoea stollwerckii* Först. emerged. Capt. Totton found the same two insects associated at Bracknell, 22nd Aug., 1931 (female specimen in B.M. coll.).

12. The host of Bracon erythrostictus Marshall (Hym.).

On 7th April, 1934, a number of galls of *Harmolita hyalipenne* (Walk.) were found at the roadside near Birdlip, Glos. The grass, as far as could be told in its withered state, was *Agropyrum* sp. The following insects emerged: — 30th May, 1934, 1 ♀; 1st June, 1 ♀; 6th June, 1 ♀; 9th June, 1 ♀; 15th June, 3 ♀♀; 18th June, *B. erythrostictus*, 1 ♂; 21st June, *B. erythrostictus*, 1 ♂; 23rd June to 9th July, *B. erythrostictus*, 2 ♀♀. This little-known *Bracon* was originally bred from 'galls on *Triticum* sp. (=*Agropyrum*).' (See Marshall in André, 'Spéc. Hym., Braconidae I,' 1888, p. 91.)

13. A parasite of the Gooseberry Sawfly.

Perilissus limitaris Gr. has long been known as a parasite of *Pteronidea ribesii* Scop. At Slough, Bucks, this sawfly is often common on the gooseberries, and 19th May, 1933, the parasite was extremely abundant flying round the bushes. Twelve males and one female were captured.

14. A parasite of Coleophora palliatella Zinck. (Lep.).

A case of this moth collected at Bagley Wood, Berks, 10th June, 1925, produced a male of *Pimpla maculator* F. (det. J. F. Perkins).

15. Parasites of Coleophora lutipennella Zell. (Lep.).

Cases of the above species collected in Bagley Wood, Berks, in 1924, produced two females of *Neliopisthus elegans* Ruthé (det. J. F. Perkins) on 9th July and 14th July, 1924. Mr. Perkins tells me that this parasite is probably the same as *Oedematopsis ops* Morley. A third case collected at Bagley Wood in 1924 produced a male of the Braconid, *Ascogaster rufipes* Nees.

16. Breeding of Pimpla alternans Gr. (Hym., Ichneum.).

On 22nd June, 1925, a black, white-marked cocoon was found

on an oak leaf at Oxshott, Surrey. Later the same year it produced a female of the above parasite (det. J. F. Perkins). The cocoon was probably that of an Ophionine on which the *Pimpla* was parasitic. O. W. Richards.

Assembling of an Ichneumon (Hym.).

On 21st May, 1933, a female *Pimpla turionellae* L. (det. J. F. Perkins) was seen exploring a grass-tuft at Windsor Forest, Berks. She was giving out a strong *Pimpla* smell. In a few seconds, two males of the same species appeared and tried to copulate with her. O. W. Richards.

Xanthia gilvago Esper (Lep.) in the Portsmouth district.

For some years I have been searching for a locality for *Xanthia gilvago* Esper near at hand, and last September found one within a few miles of Portsmouth. My previous experience of this insect was limited to the capture of a female that was drying its wings near the entrance to a wood of birch and oak. As there were no wych elms anywhere near, I concluded that it must have fed on birch or dwarf sallow, though I have never been able to find it there since. The spot first referred to is a main road, with a few wych elms on either side. Partly owing to the deposition of road material and the drought, the ground was almost of the nature of concrete. Consequently about twenty per cent. of the emergences were crippled. I had been told by other collectors that it emerged about an hour after dark, but found that such was not the case. The first emergences were before dusk, and by 9 or 9.15 p.m. not a moth was to be seen, though where they hid themselves is a mystery. I suspect they must fly again later, as no pairings were observed. Also, in my opinion, it must be a very short-lived insect, as of the sixty to seventy taken I found only one rubbed specimen, and practically all were found drying their wings. They crawl up the short grass to a height of four to eight inches, and I found them very easy to detect by the light of an acetylene lamp. I did not try sugaring for them.

The form of var. *suffusa* Tutt as illustrated by Seitz (1914, 'The Macrolepidoptera of the World,' Stuttgart, **3**: Pl. 28g), whose figure shows a considerable blackish clouding on the central area of the forewings. It would appear that this form is the most common one in Britain. I have seen two of the type form, bred from Sussex larvae this year by Mr. Wightman, of Pulborough.

The best dates for finding the insect were 12th and 14th Sept., twenty-eight specimens being taken on each occasion. The moth seems but little inclined to fly—in fact, I saw only two

on the wing—so that a net was not required for their capture. I saw many crippled specimens attacked by spiders.

A. H. Sperring.

Chrysopa albolineata nom. nov. for Chrysopa tenella Schneid. (Neur.).

Chrysopa tenella Brauer, F., 1850, *Naturwiss. Abh. Haidinger,* Wien, **4** (4): 5, Pl. 2, fig. 5 = *Chrysopa phyllochroma* Wesmael, C., 1841, *Bull. Acad. Roy. Sci. Brux.*, **8** (1): 209.

Chrysopa tenella Schneider, G. T., 1851, *Sym. Mon. Gen. Chrysop.*, Vratislaviae : 94.

In view of the prior use of the name *Chrysopa tenella*, Schneider's adoption of it in 1851 for a new species is invalid. As I have failed to find any other published name which may be applied to Schneider's species, I propose for it the name **Chrysopa albolineata** *nom. nov.*

Fredk. J. Killington.

Some additional data relating to Scottish Chrysopidae (Neur.).

The following may be regarded as a continuation of the list in 1933, *J. Ent. Soc. S. Engl.*, **1** (4): 99-101. The records are mainly the results of my own collecting of these insects in 1934, to which I have added references to a few oldish records by my late friend William Evans, published elsewhere.

The most interesting of my captures is *Chrysopa ventralis* Curt. taken in Ross-shire — not in one of the southern counties or the west, where I suggested, in my former list, additions, if any, were most likely to be made to the Scottish list. The English locality nearest the Border known to me is Hayton Moss, Cumberland, whence G. B. Routledge has recorded *C. prasina* Burm. (generally regarded as a form of *ventralis*) as occurring in July (1933, *Trans. Carlisle Nat. Hist. Soc.*, **5**: 51). However, stress can hardly be laid on the apparently wide gap in the distribution of the species while so much of the intervening country remains so imperfectly explored.

Another point of interest is that *Chrysopa carnea* Steph., after being exceptionally common in Midlothian in 1933, appears to have reverted to its former state of comparative scarcity, at least as far as my own local experience of the species may be taken to show. June and part of July, 1934, were evidently favourable for these insects, but the latter part of the season not so, although female examples of *C. flava* Scop. and *C. ciliata* Wesm. turned up at dates later than any recorded last year for these species.

In my previous note I used the term 'North Inverness' to designate that part of East Inverness (Easterness) which is cut off by the Caledonian Canal. For reasons explained elsewhere

(*Scot. Nat.*, **1934**: 85) I now consider that 'North-West Inverness' would be more appropriate.

Chrysopa flava Scop.

MIDLOTHIAN: Edinburgh (City) in house, Blackford Road, 1 ♂, 14.vi.; Balerno dist., *circa* 800 ft., 1 ♀, 22.viii.

ROSS, EAST: Culrain, Kyle of Sutherland, 5 ♂♂, 6 ♀♀, 4-28.vii.

Chrysopa vittata Wesm.

MIDLOTHIAN: Roslin Glen, 2 ♂♂, 18 and 25.vi.

ROSS, EAST: Culrain, Kyle of Sutherland, 3 ♂♂, 4 ♀♀, 3-30.vii.

Chrysopa ciliata Wesm. (=*alba* auct.).

MIDLOTHIAN: Roslin Glen, 8 ♂♂, 6, 13 and 18.vi.; 1 ♀, 25.vi.; 3 ♀♀, 8-17.viii.

Chrysopa tenella Schn.

MIDLOTHIAN: Roslin Glen (N. Esk valley), three specimens, 13 and 25.vi. I find that W. Evans had already taken the species in the county at Arniston (S. Esk valley), 8.viii.1902 (*Scot. Nat.*, **1913**: 213); he also recorded it (*loc. cit.*) from

CLACKMANNAN: Tullibody, 21.vi.1909.

Chrysopa ventralis Curt. (type form).

ROSS, EAST: Culrain, Kyle of Sutherland, one example, 17.vii.

Chrysopa carnea Steph. (=*vulgaris* Schn.).

MIDLOTHIAN: Roslin Glen, two examples only, 24.viii. and 5.ix.

Chrysopa phyllochroma Wesm.

EAST LOTHIAN: Luffness Mill, Gullane, 20.vii.1898 (W. Evans); mentioned by him as occurring in the 'Forth area' (*Scot. Nat., loc. cit.*) a drainage area including eight or nine counties, at least in part. For the exact data and an opportunity of examining the two specimens I am indebted to Miss C. Ethel Evans. KENNETH J. MORTON.

Habits of the larvae of Hydroptilidae (Trichoptera): a correction.

In the above-mentioned note (1934, *J. Soc. Brit. Ent.*, **1** (2): 45) there is an obvious error connected with the figures relating to the salinity of the Baltic and North Sea water. In my MS. the figures are correctly given as being 'per mille' and not 'per cent.' as they are printed. The lines in question should read: 'Silfvenius states that the salinity on the surface in the summer of 1904 varied between 4·94 and 5·91 ‰, and at a depth of 18 m. between 5·41 and 6·42 ‰. (The average salinity of the North Sea is given as 32·823 ‰ in the only authority to which

I can refer at the moment.)' That is to say, the proportion of salt in North Sea water averaged 32·823 parts in 1,000, and in the Baltic water at Tvärminne varied between 4·94 and 5·91 parts in 1,000, and so on. KENNETH J. MORTON.

An interesting melanic aberration of Aglais urticae Linn. (Lep., Nymph.).

A rather extreme aberration of *A. urticae* Linn. was captured in my garden at King's Somborne, Hants, on 23rd Sept., 1934, visiting the flowers of a *Buddleia* sp. The insect has the two small black discal spots of the upper side of the forewings quite absent (as in ab. *ichnusa* Stdgr.), but it has the three large black spots along the costal margin united so as to form a long black bar. The small bluish-white spot towards the wing-tip which normally follows the third of these costal black spots is, however, present.

The variation of the upper side of the forewings is thus of the type figured by F. W. Frohawk (1925, 'Natural history of British butterflies,' London, **1**: Pl. 25, Fig. 18), but the ground colour is without the inward extensions of marginal yellow colour shown by Frohawk's specimen (Sussex, July, 1896, Farn coll.), and the three large black spots along the costal margin are completely coalesced into a single long black bar, whereas in Frohawk's figure the basal of these three spots is but narrowly united to the other two along the costal margin only.

The tips and outer margins of the forewings are pale fulvous, the usual black pigment being reduced to a row of small indistinct blackish dashes.

The upper side of the hindwings is in general of normal type, but the reddish-orange ground colour is indistinctly suffused with black; this is more noticeable in the left wing, in which the wing veins are also indistinctly indicated by blackish. This left hindwing also differs from the right in having the marginal row of bluish spots replaced by pale whitish-mauve, and in having a narrow strip of the costal margin undeveloped.

The underside of both pairs of wings is more or less normal, but there is an indistinctly defined area of reddish-brown coloration about the centre of each of the forewings.

The specimen appears to resemble the insect figured in 1931, *Lambillionea,* **30**: Pl. XI, Fig. 1, as ab. *leodiensis* Cabeau. The insect is a female, and is now in the collection of Mr. S. G. Castle Russell, of Crawley, Hants.

A series of notes dealing with the variation in this species by Messrs. H. J. Turner, C. W. Sperring, and others, appeared in *Proc. S. Lond. Ent. Nat. Hist. Soc.,* **1919-20**: 70-78.

E. RIVENHALL GOFFE.

Tipulidae (Dipt.) from the Scottish Highlands.

I have received from Mr. E. Rivenhall Goffe a small collection of Tipulidae taken by him in the counties of Inverness and Nairn between 26th May and 7th June, 1934. The determinations are as follows :—

TIPULINAE.

Tanyptera nigricornis Meig. — 1 ♂, Cairngorm, Inv'ss., 3.vi. 1934 ; 1 ♀, Speybridge, Inv'ss., 4.vi.1934.

Tipula variipennis Meig.—1 ♂, Loch Vaa, Inv'ss., 26.v.1934 ; 2 ♂♂, 1 ♀, Abernethy Forest, Inv'ss., 30.v.1934.

Tipula rubripes Schum.—1 ♀, Abernethy Forest, Inv'ss., 29.v. 1934, a rare species.

Tipula alpium Bergr.—1 ♂, 1 ♀, Glen Einich, Inv'ss., 6.vi.1934.

LIMONIINAE.

Rhipidia maculata Meig.—1 ♂, Streens, Nairnsh., 7.vi.1934.

Dicranomyia affinis Schum.—1 ♀, Cawdor, Nairnsh., 7.vi.1934.

Dicranomyia morio Fabr.—1 ♂, Granish, Inv'ss., 27.v.1934.

Limonia nubeculosa Meig. — 1 ♀, Abernethy Forest, Inv'ss., 28.v.1934.

Ormosia fascipennis Zett.—2 ♀♀, Granish, Inv'ss, 27.v.1934.

Limnophila phaeostigma Schum. — 1 ♂, Glen Einich, Inv'ss., 6.vi.1934.

Hexatoma sp.—The collection contained a male and a female of a species which, in the very brief table for this genus given by C. Pierre (1924, Faune de France, **8**: Diptères Tipulidae, 130), runs down to *H. nigra* Latr.

H. L. F. AUDCENT.

Sziladynus montanus Meig. (Dipt., Tabanidae) in Cheshire.

In 1934, *J. Soc. Brit. Ent.*, **1** (2): 48-53, Mr. G. M. Spooner records a female of this species from near Plympton, S. Devon, and he notes that the only previously recorded captures from England are the two females (from Derbyshire and Dartmoor) listed by E. R. Goffe (1931, *Trans. Ent. Soc. S. Engl.*, **1930** (6): 97).

Amongst some Diptera given to me a few years ago by Mr. H. Womersley are a male and a female of this species labelled Abbot's Moss, Cheshire, 2.viii.1909 and 6.vi.1922.

Since the publication of Mr. Goffe's paper the species has been taken in another English locality, near Hurn, in Hampshire (*cf.*, F. H. Haines, 1932, *J. Ent. Soc. S. Engl.*, **1** (2): 39-40).

Thus *S. montanus* has now been recorded from Cheshire, Derbyshire, Glamorganshire, Hampshire, and Devonshire, in addition to its Scottish and Irish localities. The species must surely be awaiting capture in the north of England.

I wish to thank Mr. E. Rivenhall Goffe for being good enough to confirm the determination. H. L. F. AUDCENT.

CONTENTS—CONTINUED.

PAGE

KIMMINS, D. E. : *Psectra diptera* Burm. (Neur., Hemerobiidae) in Britain) 63

———— A New Locality for *Boriomyia rava* Withyc. (Neur.) 63

———— Plecoptera, Megaloptera, Neuroptera, Mecoptera and Trichoptera from Aberdeen and district 64

———— British Ephemeroptera, Plecoptera and Trichoptera in 1934 65

MORTON, K. J., F.R.E.S. : Some additional data relating to Scottish Chrysopidae (Neur.) 87

———— Habits of the larvae of Hydroptilidae (Trichoptera) : a correction 88

RICHARDS, O. W., M.A., D.Sc., F.R.E.S. : Some breeding records of Diptera 80

———— Some breeding records of Hymenoptera 81

———— Assembling of an Ichneumon (Hym.) 86

SPERRING, A. H. : *Xanthia gilvago* Esper (Lep.) in the Portsmouth district 86

STOWELL, E. A. C., B.A. : *Botys nubilalis* Hübn. (=*lupulinalis* Guen.) (Lep.) in the Isle of Wight 79

Communications for publication in this *Journal* should be sent to the Editor at 9 Bullar Road, Bitterne Park, Southampton.

SOCIETY FOR BRITISH ENTOMOLOGY

List of Publications for Sale at the Nett Prices shewn.

(All prices are post free.)

SYSTEMATIC WORKS.

British Hemiptera-Heteroptera. By H. P. Jones, 1930. 88 pp., 2 Pls. 4*s.* 6*d.*

British Neuroptera. By F. J. Killington, 1929. 36 pp., 6 Pls., 6 Figs. 4*s.* 0*d.* With Supplement (*Hemerobius*), 1934, 5*s.* 6*d.*

British Tabanidae (Dipt.). By E. R. Goffe, 1930. 71 pp., 2 Pls. 5*s.* 0*d.*

British Tipulinae (Dipt.). By H. L. F. Audcent, 1932. 35 pp., 3 Pls. 4*s.* 0*d.*

Keys to British Asilidae (Dipt.). By B. M. Hobby, 1932. 6 pp. 1*s.* 9*d.*

Meigen's 'Nouv. Class.' 1800. By E. R. Goffe, 1932. 7 pp. 1*s.* 0*d.*

British Liriopeidae (Dipt.). By H. L. F. Audcent, 1934. 12 pp., 4 Pls. 1*s.* 9*d.*

British Mecoptera (Synopsis and Feeding Habits). By B. M. Hobby and F. J. Killington, 1934. 11 pp., 2 Pls. 1*s.* 6*d.*

FAUNAL LISTS.

Tortrices of Hants and I.O.W. By W. Fassnidge, 1929. 20 pp. 1*s.* 6*d.*

Macro-Lepidoptera of Hants and I.O.W. By W. Fassnidge, 1925. 42 pp. 1*s.* 6*d.*

Hymenoptera Aculeata of Hants and I.O.W. By H. P. Jones, 1926. 13 pp. 1*s.* 0*d.* With Supplement, 1932, 1*s.* 6*d.*

Paraneuroptera of Hants and I.O.W. By F. J. Killington, 1926. 9 pp. 1*s.* 0*d.*

List of British Collembola. By F. A. Turk, 1933. 6 pp. 1*s.* 0*d.*

List of Dorset Lepidoptera. By W. P. Curtis. Introduction and Part I, 1934. 102 pp. 7*s.* 6*d.*

Other Faunal Lists no longer available as separates will be found in the Transactions and Journal.

GENERAL WORKS.

'Entomology and Ethics.' By W. Fassnidge (Presidential Address, 1931), 1932. 16 pp. 1*s.* 0*d.*

Bibliography of Entom. Notes in Publications of British Local Societies. (An indispensable Supplement to the Zoological Record.)
Part I, 1933. 24 pp. 2*s.* 6*d.*
Part II, 1934. 18 pp. 2*s.* 6*d.*

SERIAL PUBLICATIONS.

ENT. SOC. S. ENGL.

THE JOURNAL.

Parts I–IV, 1932–33 (in all 112 pp., 1 Pl.). 2*s.* 6*d.* each.

THE TRANSACTIONS.

No. IV,	1928—	4*s.* 0*d.*
No. V,	1929	7*s.* 6*d.*
No. VI,	1930	*out of print.*
Vol. VII,	Part 1, 1931 ...	7*s.* 0*d.*
Vol. VII,	Part 2, 1932 ...	10*s.* 6*d.*
Vol. VIII,	Part 1, 1932 ...	8*s.* 0*d.*
Vol. VIII,	Part 2, 1933 ...	7*s.* 0*d.*

Transactions Nos. 1—3 were issued by the Hampshire Entomological Society and are out of print. Copies, however, are sometimes available, and particulars of any on hand may be had on request.

SOC. BRIT. ENT.

THE JOURNAL.

Vol. I, Part 1, May, 1934	...	2*s.* 6*d.*
Vol. I, Part 2, Oct., 1934	...	2*s.* 6*d.*

THE TRANSACTIONS.

Vol. I, Part 1, June, 1934. 102 pp., 9 Pls. 10*s.* 6*d.*

Vol. I, Part 2, Nov., 1934. 184 pp., 10 Pls. 12*s.* 0*d.*

The list of Contents of any Volume will be sent on request.

The Subscription to the Society, which includes copies of all matter published during the period covered, is 21*s.* 0*d.* per annum. There is no entry fee.

Orders, accompanied by the appropriate remittance, should be addressed to **E. Rivenhall Goffe,** Hon. Sec., 102, High Street, **Southampton.**

93.1034 L
S66

VOL. 1. PART 4.

JOURNAL
OF THE
SOCIETY FOR BRITISH ENTOMOLOGY

EDITOR:
F. J. KILLINGTON, B.Sc., A.L.S., F.R.E.S.

ASSISTANT EDITOR:
B. M. HOBBY, M.A., D.Phil., F.R.E.S.

SMITHSONIAN INSTITUTION
JAN - 8 1936
NATIONAL MUSEUM

DATE OF PUBLICATION: 28TH OCTOBER, 1935.

Copies may be purchased from the Secretary at 102, High Street, Southampton.

Price 2s. 6d., post free.

CONTENTS.

PAGE

AUDCENT, H. L. F.: *Tipula peliostigma* Schum. (Dipt., Tipul.) in Leicestershire - - - - - - 110

BOYD, D. O., B.Sc., D.I.C.: *Chasmias paludicola* Wesm. hibernating in burrow of *Megachile* (Hym.) - - 93

——— Hymenopterous and Dipterous Parasites of *Aglais urticae* Linn. (Lep.) - - - - - - - 93

——— *Tortrix pronubana* Hb. (Lep.) a pest on carnations 93

——— *Acherontia atropos* Linn. (Lep., Sphingidae) in Berks - - - - - - - - - - 94

COWIN, W. S.: Early appearance of *Vanessa cardui* L. (Lep.) in the Isle of Man - - - - - - 114

CURTIS, W. P., F.R.E.S.: A five-winged specimen of *Ilema lutarella* Linn. (Lep.) - - - - - 94

FORDHAM, W. J., M.R.C.S., L.R.C.P.: *Sziladynus montanus* Meig. (Dipt., Tabanidae) in the north of England - - - - - - - - - - 114

FREEMAN, J. R.: Early emergence of *Hyloicus pinastri* (Linn.) (Lep., Sphingidae) - - - - - - 110

——— Second brood of *Euphydryas aurinia* Rott. (Lep., Nymph.) - - - - - - - - - 110

GOFFE, E. R.: Male Tabanidae (Dipt.) in the New Forest, Hants, 1933–34 - - - - - - - - 100

KILLINGTON, F. J., B.Sc., A.L.S., F.R.E.S.: Notes on the habitat and life-history of *Nathanica* (*Nothochrysa*) *fulviceps* (Steph.) (Neuropt.) - - - - - - 110

MORTON, K. J., F.R.E.S.: Plecoptera, Neuroptera (s. str.) and Trichoptera in Banffshire in May, 1934 - - 96

——— Plecoptera and Trichoptera from St. Mary's Loch, Selkirkshire - - - - - - - - - - 98

HON. EDITORS: First Annual Congress of the Society for British Entomology, Oxford, July, 1935 - - 91

——— Fauna of Cambridgeshire - - - - - 113

HON. LIBRARIAN: The Library - - - - - - 92

Communications for the *Journal* should be sent to the Editor at:

9, Bullar Road, Bitterne Park, Southampton.

JOURNAL OF THE SOCIETY FOR BRITISH ENTOMOLOGY

VOL. I. 28TH OCTOBER, 1935. PART 4.

First Annual Congress of the Society for British Entomology, Oxford, July, 1935.

This Congress was held in the Oxford University Museum from the 12th to the 15th July, in co-operation with the Ashmolean Natural History Society of Oxfordshire. About seventy members and visitors were present and the Congress was undoubtedly a great success. Accommodation was provided by Jesus College and Somerville College.

13th July.

The first official meeting was held in the lecture theatre of the Museum on the morning of the 13th, when an address of welcome to the Congress was given by Professor Sir Edward B. Poulton, M.A., D.Sc., F.R.S. This was followed by a paper on 'Courtship and allied problems in Insects' by the President, Professor G. D. Hale Carpenter, M.B.E., D.M., F.L.S. (see Transactions, Vol. 2, Part 2).

In the afternoon the Congress re-assembled in the lecture theatre to hear a paper by Dr. N. Cunliffe, M.A., D.Sc., F.R.E.S., on 'The production of oat varieties resistant to the attack of the frit fly.' The results of the valuable research work being carried out in Dr. Cunliffe's department were described during the course of the paper and illustrated by lantern slides. A visit was then paid to the School of Forestry, where an address entitled 'The present entomological problems of the Forestry Commission' was given by Dr. R. N. Chrystal, M.A., D.Sc. Lantern slides were shown to illustrate the damage done by insect pests to various trees, and at the conclusion of the lecture the members of the Congress were invited to inspect an extensive collection of exhibits arranged by Dr. Chrystal to provide a further illustration of the work of the School of Forestry. There was also a visit to the Old Ashmolean, organised by Dr. R. W. T. Gunther, M.A., LL.D., who very kindly acted as guide to the wonderful collection of historical scientific instruments, manuscripts and original drawings.

The Congress dinner was held at 8 p.m. in the hall of Jesus College, and was preceded by an informal converzatione in the college quadrangles from 6.30 p.m. to 8 p.m.

14th July.

Two papers were read during the morning of the 14th: the first on 'Insect Migration' by Dr. C. B. Williams, M.A., Sc.D.,

the second on 'Wegener's theory of the movements of the Continents' by Dr. K. G. Blair, D.Sc., F.R.E.S. Dr. Williams' paper gave an outline of the discoveries that have so far been made relative to the difficult problems of insect migration and indicated the lines on which future work should proceed. Appendices to this paper were provided by Mrs. K. Grant and Captain T. Dannreuther. Mrs. Grant gave an account of the migration of certain species of butterflies over a number of years, while Captain Dannreuther described the recording scheme of the South Eastern Union of Scientific Societies. Dr. Blair's paper brought forward the little-known subject of Wegener's theory, and is published in full in the Transactions of this Society, Vol. 2, Part 2.

Sunday afternoon was devoted to an inspection of exhibits brought by members and visitors, and three special exhibits by the University Museum. The latter consisted of a large collection of Lepidoptera illustrative of mimicry, a very extensive series of predacious insects with prey, and a collection of fossil insects.

At 4.30 p.m. the Congress assembled in the lecture theatre for the final indoor meeting. At the close of the President's valedictory address it was announced that the Society had been invited by the Cambridge Natural History Society to hold its second Congress, in 1936, at Cambridge.

15th July.

On Monday, the 15th, a field meeting was held in Bagley Wood, and was attended by over thirty members.

EDITORS.

The Library.

It has been hoped, for some time, that it might be possible to bring out a catalogue of the library. However, this project has had to be abandoned temporarily, as circumstances do not permit of the books being accommodated in an accessible manner, and a catalogue of books which cannot be issued to members is obviously useless.

The object of this note is to call the attention of members to the fact that, although books and periodicals cannot yet be issued, the separates *are* available. Under this heading are listed a number of works, most (though not all) of which are reprints of papers from periodicals. The indexing of these has been completed, and they are now available to members of the Society. In this connection it may be well to impress on members the absolute necessity of quoting the author's name as well as the title of the paper when inquiring for it (with the obvious exception of anonymous papers!).

I find that reprints of papers by the members of this Society are in a minority among the separates. This state of affairs seems most regrettable, and it is hoped that everyone will see that his own works are represented in the library by giving reprints of past papers, and future ones as they appear, to the library.

If members who would care to offer reprints of their papers will send me a list, I shall be very pleased to let them know which of the papers are required. This will save them the trouble of sending reprints which are already in our possession, and will avoid duplication of the separates in the library — a state of affairs which we wish to avoid, as far as possible, as space is limited.

I hope that members, and others interested in the Society, will help us to make this part of our library as complete as possible.

D. O. Boyd (Hon. Librarian).

Chasmias paludicola Wesm. hibernating in burrow of Megachile (Hym.).

Two females of this Ichneumonid were found in November, 1934, by Mr. R. F. Twist at Burnham, Bucks, in the burrow of a *Megachile* in a willow post. The Ichneumons were at the bottom of the burrow, below the lowest of the cells, and were moderately active when found. They are Lepidopterous parasites known to hibernate, but this seems a rather curious situation. As there was no crevice communicating with the burrow of the bee, and the cells fitted the burrow closely, I can only suppose that the Ichneumons must have entered the hole in the willow post before the bee laid down the first of its cells. I am indebted to Dr. O. W. Richards and Mr. J. F. Perkins for the determination of the Ichneumonids. D. O. Boyd.

Hymenopterous and Dipterous Parasites of Aglais urticae Linn. (Lep.).

A pupa of this butterfly was taken at Reading, Berks, in 1934 by Mr. W. E. H. Hodson, and twelve parasites emerged from it. These were one specimen of the Tachinid *Compsilura concinnata* Mg. and eleven specimens of the Chalcid *Pteromalus puparum* L. I am indebted to Dr. O. W. Richards for the determination of these specimens. D. O. Boyd.

Tortrix pronubana Hb. (Lep.) a pest on carnations.

The larvae from which these specimens were bred were obtained by Mr. W. E. H. Hodson from carnations and vines (under glass) in the Hampton district (Middlesex).

This Tortricid is well known as a pest of carnations, particularly on the Continent, and is reported to feed on a great variety of plants in the open in this country. I shall be very glad to have information on the distribution of this moth in the wild state, as this will help us greatly in estimating its importance as a potential pest of carnations. D. O. Boyd.

Acherontia atropos Linn. (Lep., Sphingidae) in Berks.

On 29th November, 1934, two pupae of this moth were received from Didcot, where they had been found on allotments.

Two other specimens have been reported from the Manor Farm Allotments, Reading : one a newly-emerged female, which was found on 9th October, 1934, and the other a larva (date when found not recorded), which emerged on 12th October, 1934. This latter specimen was a male. The pupa had been kept in a warm room. D. O. Boyd.

A five-winged specimen of Ilema lutarella Linn. (Lep.).

In looking over the series of *Ilema lutarella* Linn. in the cabinets of the late Mr. Alan Druitt, F.E.S., for the purpose of an intended investigation into the differences between the British specimens and the Continental ones, I selected one for the purpose of mounting the genitalia. On turning it upside down in order to remove the abdomen the more readily, I thought that I had torn a hindwing, but on investigation found that the hindwing had something attached to it. This I examined under the microscope, and as it appeared to be an extra piece of wing attached to the under surface of the right hindwing, I detached the hindwing and from it carefully removed the attached excrescence and mounted it, to find it was a supernumerary wing. The specimen has no proper data, but was purchased by Mr. A. Druitt from the collection of Mr. P. M. Bright, F.R.E.S., M.S.B.E., when that gentleman dispersed his Heterocera at Stevens' Auction Room. I think it is indubitably a specimen taken in the British Archipelago and most likely in Ireland.

As the abnormality was present, I mounted all four wings (which are normally developed and symmetrical and are in no way undersized), and the rest of the appendages as well as the genitalia and head.

Dr. E. A. Cockayne, M.A., F.R.E.S., has collected together and discussed a number of cases of extra wings in 1927, *Trans. Ent. Soc. London,* **70**: 163 *et seq.,* pls. xvii-xix ; 1930, **78**: 222 *et seq.,* pl. xiii.

Since I am entirely unable to discover anything leading to any other conclusion, I should place this specimen in Class I as defined by Dr. Cockayne, *l.c.* I naturally expected to find some other abnormality present, and since the appendage is metathoracic, directed particular attention to the appendages of that segment, but entirely without result.

I should add, perhaps, that although in Lithosiinae neuration is very unstable, and one frequently finds the neuration, especially in the forewings, markedly asymmetrical, in this particular specimen the forewing neuration is to all intents and purposes on both sides in compliance with the generic characters.

The supernumerary wing is 4 mm. in length. What appears to me to be the upper surface is attached to the under surface of the base of the cell of the right hindwing, and is so firmly attached that I had to cut away a part of the membrane of the normal hindwing to detach it. The colour was that of a normal hindwing. A reference to Fig. 9B shews that there is a costa, termen, and dorsum, and that there is a single nervure which I construe as an anal nervure No. 1 b (or A ii), and above that a single forked nervure which I take to be a cubitus or 2 stalked with 3. The edge of the wing is thickened as usual. The dorsum has a few hairs like those of any normal wing. The termen is ciliated, but the apical cilia are very unusually long, very strongly developed, have lost the character of hairs, and become well-developed scales.

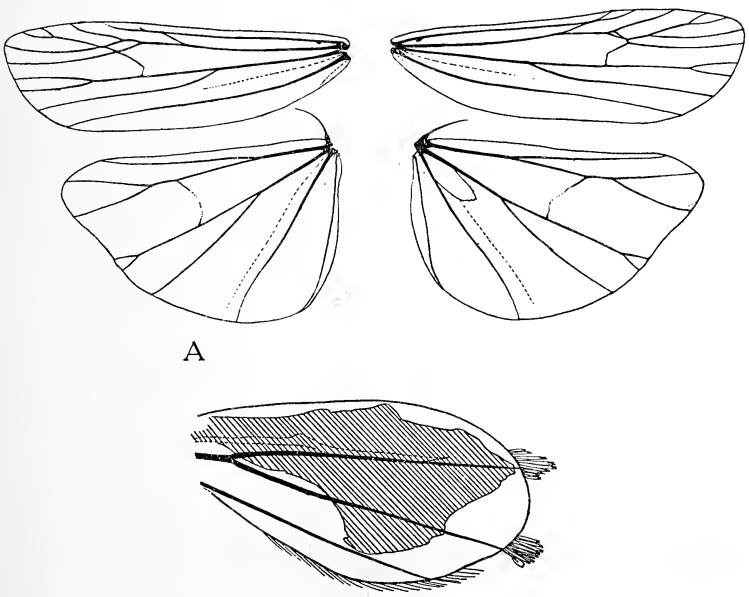


Fig. 9.—Five-winged specimen of *Ilema lutarella* Linn.
A.—The four ordinary wings. B.—Supernumerary right hindwing.

I should regard this as a picture of the anal area of a hindwing. Dr. Cockayne, who has kindly read through this for me (and suggested improvements in the draft that I have adopted), and examined the slides, says that he is unable to say whether this is a right hindwing or a left hindwing. I was equally unsuccessful in satisfying myself on this head when I examined it before mounting it, but we agree that it is a hindwing.

W. Parkinson Curtis.

Plecoptera, Neuroptera (s. str.) and Trichoptera in Banffshire in May, 1934.

Perhaps the belief that few records exist of Banffshire Neuroptera (*sens.* Linn.) may be a sufficient reason for giving the following scanty list of captures in that county during the second half of last May. The trip was rather a failure, or at least one of the most barren of my attempts to collect these insects in the Highlands in the spring.

Leaving Edinburgh on the morning of the 14th May in fairly bright, if rather cold, weather, after passing Dunkeld we ran into a veritable snow-storm. At Dalwhinnie the conditions would have been objectionable enough on a winter day; in May they were unspeakable. Off and on snow and sleet fell until we reached our destination in Glen Avon, and the next two days were of the same kind. Even after that showers of snow, sleet and rain were only too frequent, with winds that were often strong and always cold. Only on the last few days of the month was there real amelioration when insect life began to respond. The snow had melted almost as it fell on the low ground, but the higher Cairngorms still carried a considerable amount when we left on the 30th — a beautiful day, comparatively still and warm. It was cheering on the 16th during a very brief interval of sunshine to see a small tortoiseshell butterfly briskly flying about the road-side; later when the weather improved others were seen from time to time, and by the end of the month the green-veined white had become fairly common. No other butterflies were seen.

The Avon from Loch Avon in the high Cairngorms is a fine river with many tributary streams large and small. Birch woods in the glen are extensive, with plenty of rowan, gean, bird cherry, a good deal of juniper and many willows, some of them still with catkins in May. There are also plantations of conifers. The woods are carpeted with *Anemone nemorosa* L., a form with a purplish tint being fairly frequent, and primroses are plentiful on banks with the right exposure. Our station was at an altitude of 700-800 ft., between Ballindalloch and Tomintoul, six or seven miles from the latter place. No doubt the glen has its attractions, but we were much too early for the higher part

and the spring was late; this, combined with bad weather, was against success. We fared widely in all directions beyond the glen and county, even crossing over to Braemar, but our collecting was restricted to our nearer surroundings in the glen.

The following species were taken:

Plecoptera.

Perla carlukiana Klapálek.—No imagines were seen. A local angler who had fished in the Avon from his boyhood told me that large stone-flies were not numerous there. The river was in spate for some days after so much snow and rain, but when it had fallen sufficiently to admit of searching at likely points I was always able to find a few larvae of this species any time I looked for them. Two or three were also found in one of the larger burns. I cannot help thinking that a little later in the season the imagines would be common enough.

Perla cephalotes Curt. — A single larva in the river on the 27th; easily distinguishable from the preceding by its darker coloration and different markings.

Chloroperla grammatica Poda.—Not before the 20th, and then under stones; later becoming common on bushes and in flight.

Isopteryx tripunctata Scop. — As the preceding; very abundant at the end of the month.

Isopteryx torrentium Pict.—Not seen until the 27th, when it was taken at one of the burns; no doubt becoming common at these.

The other species taken were all common and call for no special remarks: *Taeniopteryx risi* Morton, *Leuctra nigra* Pict., *L. inermis* Kempny, *L. hippopus* Kempny, *Protonemura meyeri* Pict., *Amphinemura cinerea* Oliv., *Nemoura variegata* Oliv., *Nemurella inconspicua* Pict.

No specimens of *Capnia* were taken.

Neuroptera (*s. str.*).

The extreme scarcity of these insects was at once the striking feature of my collecting and my chief regret. Just three specimens were taken and these belonged to three species: *Hemerobius stigma* Steph., ♀, 23.v.; *Hemerobius simulans* Walk., a mature ♀, 28.v; and *Boriomyia nervosa* Fabr., a mature ♀, black form, 29.v, from one of the many birches on the river bank. A good many hours were spent in the birch-woods looking for the last-named and other birch-frequenting species, but without success. It seems more probable that the emergence of the spring species had been retarded by the inclement weather than that there had been any emergence of consequence and the insects wiped out. On the other hand, as far as I remember, I have never before seen *H. simulans* on anything like so early a

date; running over my diary for the current year, my next capture seems to have been a female in Ross-shire on 3rd July.

TRICHOPTERA.

Two species only were observed: *Glossosoma vernale* Pict. and *Brachycentrus subnubilus* Curt. Of the former a single male was found on the 17th under a stone by the river-side; it was not met with again until nearer the end of the month, when it gave promise of becoming common. *B. subnubilus* was first noticed on the 28th, a few being taken on that and the following day. KENNETH J. MORTON.

Plecoptera and Trichoptera from St. Mary's Loch, Selkirkshire.

Until the spring of 1934 I had never collected at any of the waters in the eastern part of the Southern Uplands, and it may be worth while to record the few species of Plecoptera that were taken during a very short visit to St. Mary's Loch in Selkirkshire on the afternoon of 5th May last. Not only was our stop at the loch short, but the conditions for collecting could hardly have been worse. The previous day had been quite summer-like, but on the 5th the weather had gradually deteriorated and when the loch was reached the wind was of full gale force, and it was accompanied by pelting hail-showers which followed us with increased severity all the way of our return down the valley of the Yarrow to near Selkirk. Running the car into the mouth of a small quarry, where it was more sheltered from the wind, I turned my attention to the shores of the loch. There was practically nothing in the shape of bushes or trees at the place to give harbour to insects, and even if there had been I doubt if any would have remained in them. Stone-turning, however, at once showed that there were many Plecoptera. Some idea of the wind may be gathered when I say that when holding a stone in one hand and a light tube in the other, into which I was trying to coax a specimen, the tubes were twice whipped out of my fingers and broken to bits on the shingle.

St. Mary's Loch lies at an altitude of 729 feet at the head of the valley of the Yarrow, which along with the nearly parallel valley of the Ettrick may be said to comprise, roughly speaking, nearly the whole county of Selkirk. While the scenery surrounding this upland loch is of a rather different type from that encircling Loch Rannoch and the rock formation (Silurian) also different, yet the species of Plecoptera which occurred at St. Mary's are the same as those which may be taken at the Highland loch just named, in the spring. I do not think this fact makes them of less interest, and besides they are not without some local characteristics. The only species of Trichoptera

noted, a single female of *Apatania wallengreni* McLach., is also a well-known Perthshire species common at Loch Rannoch.

The Plecoptera belong to the following species:

Dictyopterygella bicaudata Zett., Linné? (*recta* Kempny): I am satisfied that this species was common, although, being more anxious to secure a good series of *Capnia,* only two males and one female of the *Dictyopterygella* were retained. The species is in my collection from the following vice-counties and localities, the first figures showing the altitudes in feet:

North Lancashire: Coniston Lake, 143, 8-28.iv.1925.
Selkirk: St. Mary's Loch, 729, 5.v.1934.
Midlothian: Pentland Hills, Logan Lee, 900, 5.v.1913.
Kinross: Loch Leven, 351, 4.vi.1909.
Stirling: Loch Lomond, east side, 23, 6.v.1895.
Perth, West (or South): Lake of Menteith, 55, 3.vi.1910; Loch Ard, 105, 4.v.1903; L. Lubnaig, 405, 5.v.1902.
Perth, Mid: L. Rannoch, 668, 30.v.1903, etc.; L. na Lairige, 1,603, 28.vi.1895.

In several localities the species occurred in more or less close association with *Perlodes mortoni* Klapálek (small lake form). At Loch Ard in particular both were very abundant together under stones on the loch margin, and regarded superficially they looked very similar. The usual length of the forewings in British females is 10-12 mm. In the female from St. Mary's Loch they measure 10 mm. I think more material from there will show that they are on the small side in size. The examples from L. na Lairige, a lochan in the Breadalbane range, belong to a depauperated form with forewings only 7·5 to 8 mm. long in the female. It should be kept in view that the species has a rather wide distribution in Ireland (King and Halbert, 1910, *Proc. R. Irish Acad.,* **28** (B): 60).

Capnia atra Morton: A series of both sexes. The specimens are small with abbreviated wings, the forewings approximately $3\frac{1}{2}$ mm. long in the males and $4\frac{1}{2}$-5 mm. in the females. In my notes on specimens from localities north of the Forth the forewings are stated to be 5-6 mm. in length in the male and 7-8 mm. in the female. Old females from Braemar (Buchanan White), which cannot now be re-examined, had somewhat abbreviated wings. As far as I am aware the species has not been taken in Scotland before south of the Forth. If my determination was right, it occurs in a brachypterous form at the Devil's Punch-bowl on Mangerton, Kerry (King and Halbert, *loc. cit.*: 61).

Capnia nigra Pictet: Two males only. Females would have been of particular interest for comparison with short-winged specimens from Coniston and Loch Ard.

Leuctra inermis Kempny: One male. Plenty of Leuctras were present, perhaps of more than one species, but I could not give them attention at the time.

It was not convenient to revisit Yarrow until 1st October, when a few hours were spent at St. Mary's Loch and the Loch of the Lowes, these two being connected by a very short stream. It was a good autumn day, but the season was too far advanced and the locality is rather exposed. Nothing of great importance was taken. The only species of Plecoptera seen was the ubiquitous *Leuctra fusciventris* Steph. (=*klapáleki* Kempny), which was common. Three species of Trichoptera were fairly numerous: *Anabolia nervosa* Curt., *Halesus auricollis* Pictet and *Drusus annulatus* Steph. There was no time to try some of the lateral burns, which might have produced two or three additional species.

KENNETH J. MORTON.

Male Tabanidae (Dipt.) in the New Forest, Hants, 1933-34.

The habit of male Tabanidae in coming to pools and sluggish streams to drink in hot weather has been noted in the British Isles by Jones (1922) and by Goffe (1931), and abroad by Neave (1911, 1912) and Portchinsky (1915).

Male Tabanidae are normally rarely seen and are distinctly rare in collections; they apparently spend most of their time in lofty flight, and in normal years may find sufficient moisture for drinking in the dew on the leaves of the trees, etc. Hot dry weather, however, increases their thirst and provides little or no dew; the insects thus have to descend to puddles or sluggish streams to drink, and in so doing afford the collector a somewhat difficult chance of effecting a capture.

The ideal conditions are a long spell of hot, dry weather following a period of drought; nearly all the puddles and streams then become dried up, and the insects from quite a wide area have all to come to drink at the very few places where water still remains.

The years 1929-32 did not provide these conditions, the hot spell at the end of August, 1931, being too late in the season; the year 1933 was, however, very hot and dry, whilst 1934, following the very dry winter which intervened, has seen conditions of drought which may not recur for years.

The most suitable situation was found to be a short ditch at right angles to a forest riding, well sunk below the level of the adjacent ground and so placed that it is in the full glare of the mid-day and afternoon sun. In drought years such places are not easily found, but the writer was able to discover several in the Lyndhurst—Beaulieu district of the New Forest, Hants, and to these places large numbers of male Tabanidae came to drink right through the season. They appeared to be flying up and down above the forest ridings, and to descend to drink as they crossed the ditch. The fact that the latter was sunk below the level of the adjacent ground (in a 'cutting,' so to speak) greatly

increased the chances of effecting a capture, as it was necessary for all the would-be drinkers to decelerate, to descend between the banks in a more or less fixed direction, and to rise steeply after drinking in much the same way. The writer was thus able to find a place or places where he could remain in one position and strike at specimen after specimen as they passed before him.

The insects were, however, so quick and alert that even in these advantageous circumstances a capture could only be effected in about one case in six, whilst at pools or streams in more open situations, where the insects could come from any direction to any part of the pool, etc., it was difficult to make any captures at all.

A successful capture is usually made as the insect rises after touching the water, but a very quick and accurate stroke with the net is necessary, and one is frequently too late.

A point which causes many failures is the unexpectedly odd angle at which the rise from the water is sometimes made; the eye instinctively compares the matter with a ray of light striking a reflecting surface, or with a thrown ball about to bounce, and so expects the angle of 'reflection' to approximate to the angle of 'incidence' — and at least for them to be in the same plane. In practice the insect seems to slip or skid at the moment of contact with the water, and in consequence is liable to rise at almost any angle and in any plane.

Considerable numbers of females of Tabanidae were also found at the water, but their habits were different. They appeared to keep in the neighbourhood of the water, and to fly backwards and forwards about a foot above the surface — often without drinking. Their flight was less quick than that of the males, and they approached from one side rather than from above, often flying through the opening under the road to the continuation of the ditch on the other side.

The eye soon became accustomed to the quicker and quite distinct flight of the males descending to drink, whilst the ear could detect a faint 'snipe-like' sound which they frequently made when decelerating quickly.

It is hardly necessary to add that scores of females were constantly in attendance on one's person, and that their attentions made it no easy matter to concentrate on securing males.

Altogether three hundred and three males were captured in the two seasons, including the much-desired males of *Tabanus miki* Brauer and of *Sziladynus solstitialis* Meigen; this large material has enabled the range of variation (at any rate in the New Forest specimens) to be comprehended, and some interesting observations to be made of the habits of the several species, which it is the object of these notes to place upon record.

Chrysops quadratus Meigen.

Large numbers of males of this species were seen and twenty-nine in all were captured. The dates range from 15th June to 2nd August.

Habit. They were observed to fly in rapid evolutions very close to the water for a few seconds, touching the water at intervals of a second or so; the movements rather reminded one of the small whirligig beetles of the genus *Gyrinus* Linn. They were also found resting on grass, etc., overhanging the water.

Variation. The series shows that the markings on the first and second visible abdominal segments in the male sex exhibit a somewhat parallel variation to that noted for the females (Goffe, 1931 : 55-56). Seven of the specimens have the orange side-spots on these segments much restricted and divided by a black band along the upper margin of segment 2; these would seem to correspond to the form *quadratus* Meig. Eleven specimens have these orange side-spots paler, more extensive, and almost or quite undivided; these would seem to correspond to form *pictus* Meig. The remaining eleven specimens are intermediate between these, and would be referable to form *intermedius* Goffe.

Chrysops caecutiens Linn.

Although numbers of females of this common species were in evidence, not a single male was captured, or observed to drink.

Genus *Chrysozona* Meig.

No males of the genus *Chrysozona* were observed to come to drink.

Tabanus bovinus Linn.

No examples of either sex of this species were taken, and the writer is confident that none was amongst those seen but not captured. The individuals which have been referred to this species in the past have with very few exceptions been found to be pale forms of *Tabanus perplexus* Verr. and there does not seem to have been any authentic capture of the true *T. bovinus* in recent years.

A single female of *T. bovinus,* stated to be from the New Forest (Simmonds coll.) but without further data, has come into the writer's possession through the kindness of Dr. W. J. Fordham, and is noted here in passing. Compared with *T. perplexus* Verr. the specimen has the sides of the first two abdominal segments a uniform and paler brown, paler legs, paler squamae, palpi almost devoid of black hairs, and the third antennal segment black except the extreme base, whilst when viewed obliquely from behind the lower margins of the abdominal segments do not ' stand out ' as they do in *T. perplexus.*

Tabanus perplexus Verr.

Fourteen males were taken, the dates ranging from 3rd to 23rd July.

Habit. Three individuals were observed to descend slowly hovering; the remaining eleven flew quickly up and down the twelve feet or so of the ditch, touched the water, and were captured in the act of rising. Several of what were almost certainly this species were observed to come straight down to the water, touch it for an instant, and rise swiftly: the writer is inclined to consider this as their normal habit, and that the others were attempts to overcome what must have been an awkward approach for a large and heavy insect.

Variation. The specimens all belonged to the type associated by the writer with the form *confusus* (*loc. cit.*: 77). Three have the third antennal segment largely orange; the remainder have this segment orange at the base only.

Tabanus autumnalis Linn.

Thirteen males were captured, the dates ranging from 16th June to 20th July.

Habit. The males of this species were all observed to fly up and down the ditch and as close to the bank as possible. Frequently they settled on overhanging grasses, etc., quite close to the water — in two cases under an overhanging bank which made a capture impossible. It is of interest to note that many more males of this species were seen than females, only some half-dozen of the latter sex being noted in the New Forest throughout the season.

Variation. The specimens taken all displayed more or less reddish side-coloration to the abdomen, but in one specimen (taken 20th July, 1933) this coloration was almost absent; the specimen thus more resembled the normal female.

Tabanus bromius Linn.

Fifty-nine males were taken, the dates ranging from 15th June to 2nd August.

Habit. This species was undoubtedly the most difficult to capture, as in almost every case the insects descended straight to the water, touched it for the merest instant, and were off again. More captures of this species were missed than of any other.

Variation. A considerable range of variation was found. The specimens varied considerably in size; the sides of the upper abdominal segments showed every gradation from no reddish coloration at all to the sides of the first three segments being noticeably reddish; and the palpi varied curiously by showing

every gradation between possessing a distinct wart or protuberance near the tips (usually with a cluster of black bristly hairs) to no visible protuberance at all.

Tabanus miki Brauer.

As no males of this species had been taken in Britain, the capture of British males was one of the main objectives, but although considerable numbers of females were 'in attendance' from 4th July to well into August no males were noted during 1933.

During the winter, however, an insect which had appeared on casual inspection to belong to the form of *T. bromius* with reddish abdominal side-coloration was found on closer study not to agree with that species; unfortunately, however, it was in very poor condition indeed, and through dying in the pill-box soon after capture had lost both its antennae on the way home.

A keen look-out was kept for similar individuals during 1934, but it was not until 15th July that one was found, and only two more were secured — both on 18th July.

The reddish abdominal side-coloration is dull, and not conspicuous enough to be noted on the wing during the second or so that the insect is seen; it cannot, therefore, be stated for certain that the male of this species rarely comes to drink, although this conclusion is suggested by the evidence.

Habit. The species may have the same drinking habit as *T. bromius,* as the first two of the four captures made were taken for that species in the field; the last two, however, were both taken together, settled momentarily on grasses after having flown along the ditch bank, and thus resembled *T. autumnalis* in habit.

Variation. The specimens conform fairly well to the very brief description extracted from continental literature in my paper on this family (Goffe, 1931), but the head is not quite so obviously wide, and none of my specimens shews any yellowish-white central mark to the lower edge of the abdominal segments 1 and 2 (? rubbed).

The antennae are very similar to those of *T. bromius,* but the palpi have the terminal segment a little longer, less stout, more olive coloured, and with darker pubescence.

The knob of the halteres is paler than in *T. bromius* and the border of the thoracic squamae is not so dark.

The longer postocular eye fringe of *T. miki* is, perhaps, the best character, whilst the notopleural calli are not brownish in my specimens as they are in *T. bromius.*

The reddish abdominal side-coloration differs in all four of my specimens and may, therefore, be considered to be variable; it extends just on to the fourth visible abdominal segment, and

varies from a light brownish-red to merely an obscure reddish suffusion. The width of the dark dorsal abdominal band also varies; in two of my specimens it is noticeably narrow, as noted in the continental descriptions, but in the other two it is not so narrow and could hardly be described as such.

The underside of the abdomen is of a light reddish-brown without any middle band, whilst all specimens of *T. bromius* with reddish coloration on the underside of the abdomen that I have seen have had a dark median band of some sort.

Tabanus maculicornis Zett.

Thirty males were captured, the dates ranging from 15th June to 23rd July.

Habit. The drinking habit of this species was observed to be similar to that of *T. bromius*; that is, the insect descended straight to the water, touched it for an instant, and rose immediately.

Variation. The specimens vary considerably in size, and most of those taken shew a small obscure reddish side-coloration to the second and third abdominal segments.

Tabanus cordiger Wied.

This species was not observed in the Lyndhurst-Beaulieu district, but a single male was captured drinking at a stream in Islands Thorns Inclosure on 1st July, 1934.

The species is fairly common in the Rhinefield Walk area, but no suitable place for the capture of male Tabanidae could be found there, and most of those seen drinking in that district were missed.

Sziladynus paganus Fabr., 1775.

The species referred to under this name is the *Therioplectes tropicus* of Verrall and the variety or species *bisignatus* Jaenn. of Verrall and other authors. No doubt the species was originally referred to *tropicus* Linn. on account of its male complying with Linnaeus' description in having the first three segments orange at the sides.

Collin (1932) considers that the real *tropicus* Linn. is represented by the specimens noted by Verrall from Worcester (1909, **5**: 359), from Glamorganshire (*op. cit.*: 771), and since taken in some numbers in the Norfolk Broads district; both sexes of this species comply with Linnaeus' brief description, there does not seem to be any conflicting evidence, so that in the writer's opinion Collin's suggestion should be adopted. If the International Commission on Zoological Nomenclature decide to authorise the establishment of 'neotypes,' this case would seem to be an excellent example of their value.

This fixation of the name *tropicus* Linn. leaves our common species in want of a name, and the question at once arises whether we should once more raise the varietal name *bisignatus* Jaenn., 1866, to specific rank, or whether there is an older valid name. Verrall (*op. cit.*: 403) has already pointed out that *Tabanus paganus* Fabr. (1775) was described from a British specimen taken near Henly (presumably Henley-on-Thames), that it was a species with 3-banded eyes and with an orange spot on each side of the abdomen, and that it could only be *T. tropicus* (*sensu* Verrall), *T. montanus,* or *T. glaucopis*. The description fits the first species better than the other two; the date of capture (28th June) would in itself almost limit it to Verrall's *tropicus* (the other two being July-August species); and finally *T. montanus* has never been taken anywhere near Henley, *T. glaucopis* has been found very locally in one locality only (Streatley Downs) nearly twenty miles away, whilst Verrall's *tropicus* is a common species in the Thames Valley. There seems, therefore, little doubt that Verrall is correct and that *paganus* Fabr. and *bisignatus* Jaenn. are the same; I suggest, therefore, that the former name be adopted for *tropicus* Verrall (*nec* Linn.) with *bisignatus* Jaenn. as a synonym.

Thirty males were captured, the dates ranging from 15th June to 22nd July.

Habit. The species descended close to the water, darted rapidly backward and forward three or four times (about 12-24 inches either way), touched the water, and then rose rapidly.

Variation. In seven specimens the orange abdominal side-coloration extends slightly on to the fourth segment.

The width of the black abdominal dorsal band varies rather considerably; in twelve specimens it occupies almost half the width of the abdomen, in eleven specimens about one-third the width, and in six specimens about one-fourth; one specimen has the band a trifle more narrow even than this.

In eighteen specimens the black abdominal dorsal band narrows abruptly as it passes from the second to the third abdominal segment, whilst in the remaining twelve specimens the margins of the dorsal band are continuous. This variation appears to be independent of that noted in the preceding paragraph.

The male of this species is very similar indeed to that of the next, and the two species appear to be very closely allied.

Sziladynus solstitialis Meig.

The female of what is almost certainly this species has been taken sparingly in the New Forest for some years past, but no males had been found. Unfortunately at least two species and the males of a third have the reddish abdominal side-coloration extending to the third segment only, which was the principal

character on which Meigen separated his *solstitialis* — and all three species occur in Britain.

The single female (from Baumhauer's collection) from which Meigen (1820) described *solstitialis* is now missing from his collection in Paris, but it was seen there by Verrall (1909, **5**: 380), and he was convinced that it was con-specific with our New Forest, Hants, and Chippenham Fen, Cambs., females.

I have come to the conclusion that the very few males which have hitherto been referred to *solstitialis* Meig. belonged either to *Sz. tropicus* Linn., *sensu* Collin, or to some other allied species, and that we had not previously recognised the male of *solstitialis* Meig. However, ten males, which appear to be true males of *solstitialis,* have now been captured; two of these were taken in July, 1933, but were not recognised as distinct from *Sz. paganus* Fabr. (= *tropicus* Verr.) until critically examined later in the year. A special look-out was kept for these in 1934 and eight more were secured, the dates ranging from 5th to 21st July.

The male has the general appearance of a small and rather pale *Sz. paganus,* but may be separated by the characters shewn in the following table :—

Sz. paganus Fabr., ♂.	*Sz. solstitialis* Meig., ♂.
1. Abdominal upper side pubescence black except for a central and two lateral spots on lower margins of segments. Underside with conspicuous admixture of black hairs.	1. Abdominal upper side pubescence considerably pale on the yellowish side spots, and nearly all pale beneath.
2. Margins of squamae brownish.	2. Margins of squamae paler.
3. Palpi black with brownish tips.	3. Palpi pale at the tips and much less dark elsewhere.
4. Side pubescence of thorax and hairs on scutellum black.	4. Side pubescence of thorax and hairs on scutellum considerably greyish.
5. Third antennal segment bright orange, obscurely darkened above and towards the tip, and tapering gradually from the not very pronounced hump at the base.	5. Third antennal segment brownish-orange, with black tip, and narrowed rather abruptly after the prominent hump at the base.
6. Abdominal side-colouring reddish-orange with slight blackish suffusion.	6. Abdominal side-colouring more yellowish-orange and with practically no blackish suffusion.

7. Ocular pubescence brownish, paler at the extreme sides, and rather dense.	7. Ocular pubescence less dense and pale grey except for a dark grey central area.
8. Abdominal dorsal band wider and less sharply defined.	8. Abdominal dorsal band narrower, more sharply defined, and with a distinct central whitish mark on the lower margin of each segment.

The close general resemblance to *Sz. paganus* Fabr. (= *tropicus* Verr.) makes it quite possible that males of *Sz. solstitialis* Meig. may be found in collections under the former species; it is therefore suggested that all males in collections under *tropicus bisignatus* be carefully re-examined.

Habit. Of the ten males captured eight were drinking and had a habit quite similar to that of *Sz. paganus*. Two males, however, were attracted to my car and were netted settled thereon after flying round it as females of Tabanidae are wont to do. On neither occasion did females of the species appear to be present, although five were taken that day in the locality.

Sziladynus distinguendus Verr.

The males of this species were exceedingly numerous and no less than one hundred and thirteen captures were made.

This long series shows that the dorsal abdominal band varies very much in width. In five specimens it is very narrow on the second segment, reduced to a mere speck on the third, but reappears on the fourth. In eleven specimens this dorsal band is quite distinct on the third segment, though barely reaching its lower margin, and in thirteen specimens it just reaches the lower margin.

From these the dorsal band gradually increases in width until fourteen have a band about one-fourth the width of the segment.

The orange abdominal side coloration is on an average slightly yet distinctly paler in the males than in the females, and in about half-a-dozen specimens has a distinct yellow tinge. The extent to which this coloration is present on the fourth segment varies considerably, as in the females.

The colour of the ocular pubescence when viewed in artificial light appears to vary between dark and pale, but the variation is, I think, caused by manipulation of the light.

Habit. The drinking habit of this species was observed to be generally similar to that noted for *Sz. paganus* Fabr.

Sziladynus micans Meig.

This early spring species is very uncommon in the New Forest, and no males were observed to drink.

Atylotus fulvus Meig.

The females of this handsome species were in numbers on and near the marshy heaths, and odd specimens were seen occasionally near the ditch; but no males whatever were seen or taken drinking.

Conclusions.

The inferences to be drawn from the material studied may be summarised as follows:—

(*a*) That those species of *Sziladynus* Endln. (=*Therioplectes* Verr. *nec* Zell.) which were observed have a distinct and characteristic drinking habit: they descend to within a few inches of the surface of the water, dart rapidly to and fro three or four times, touch the water for an instant, and then fly rapidly up and away.

(*b*) That of the species *Tabanus* Linn. observed drinking, *T. bromius* Linn. and *T. maculicornis* Zett. appear to descend straight to the water, touch it for the merest instant, and rise rapidly; but *T. autumnalis* Linn. and perhaps *T. miki* Brau. descend to the water and then fly backwards and forwards close to the bank and at but moderate speed before drinking, sometimes settling on grass stems, etc. *T. perplexus* Verr. displayed something of both habits and cannot be definitely placed in either group.

(*c*) That the very small number of males of *T. miki* observed compared with the number of females seen suggests that they do not come to water as frequently as the other species.

(*d*) That no males either of *Chrysozona* Meig. or of *Atylotus* Osten-Sacken were observed to drink.

(*e*) That although females of both *Chrysops caecutiens* Linn. and *Chrysops quadratus* Meig. were present, only males of the latter were taken drinking.

References.

Buxton, P. A. 1932. Terrestrial insects and the humidity of the environment. *Biol. Rev.*, **7**: 278.

Collin, J. E. 1932. A review of Mr. E. Rivenhall Goffe's paper on Tabanidae. (Trans. Ent. Soc. S. of England, 1930). *Ent. Rec.*, **44**: 37–9.

Fabricius, J. C. 1775. Systema Entomologiae. Flensb. et Lips.: 789, 12.

Goffe, E. R. 1931. British Tabanidae (Diptera). *Trans. Ent. Soc. S. Engl.*, **1930** (6): 43–114.

Jones, H. P. 1922. Some notes on the habits of ♂ Tabanidæ. *Entomologist*, **55**: 40–2.

Meigen, J. W. 1820. Systematische Beschreibung der bekannten europäischen zweiflügligen Insekten. Aachen. **2**: 56, 33.

Neave, S. A. 1911. Report of a journey to the Luangwa Valley, north-eastern Rhodesia, from July to September, 1910. *Bull. Ent. Res.*, **1**: 303–17.

———— 1912. Notes on the blood-sucking insects of eastern tropical Africa. *Bull. Ent. Res.*, **3**: 275–323.

Portchinsky, L. 1915. [Tabanidae and the simplest methods of destroying them.] In Russian, *cf.* 1915, *Rev. Appl. Ent.* (B) **3**: 195–6.

Verrall, G. H. 1909. British Flies. London. **5**.

E. Rivenhall Goffe.

Tipula peliostigma Schum. (Dipt., Tipul.) in Leicestershire.

On 10th June, 1934, Mr. E. Rivenhall Goffe took a pair of this species by the side of the Fosse Way in the neighbourhood of Six Hills, Leicestershire. The species is uncommon, and records of its capture are infrequent.

H. L. F. Audcent.

Early emergence of Hyloicus pinastri (Linn.) (Lep., Sphingidae).

Mr. L. Burt of Ashley, New Milton, obtained some ova from a female *Hyloicus pinastri* Linn. taken towards the end of May, 1934. Larvae from these eggs pupated about 20th July and five imagines emerged on 21st August; the remaining specimens are apparently passing the winter as pupae.

J. R. Freeman.

Second brood of Euphydryas aurinia Rott. (Lep., Nymph.).

A female of *Euphydryas aurinia* Rott. was captured by Dr. J. Hope of Manchester, at Hodd Hill, on 23rd August, 1934. A male was seen at the same place on 25th August by Mr. Ford of Bournemouth, and a week later the same gentleman saw a further male which may or may not have been the one previously seen.

J. R. Freeman.

Notes on the habitat and life-history of Nathanica (Nothochrysa) fulviceps (Steph.) (Neuropt.).

Two species of the genus *Nathanica* occur in the British Isles, *N. capitata* (Fabr.) and *N. fulviceps* (Steph.). The first of these is a local and rather uncommon species associated with conifers and its life-history has been described by Withycombe (1923). The second is, apparently, an extremely rare species and nothing has been published concerning its early stages.

It is due entirely to the kindness of Mr. H. L. Burrows, of Manchester, that I am able to give the following contribution towards a knowledge of the life-history of *N. fulviceps,* and I have to thank him, not only for supplying information on the habitat, etc., of this little known insect, but also for sending me first instar larvae in spirits so that this stage might be described and figured.

Habitat and Distribution.

Mr. Burrows, who has probably had more experience of *N. fulviceps* in the field than any other entomologist, informs me that '*Fulviceps* in these districts [Staffordshire and Shropshire] frequents tall oaks, all those taken being off such oaks, or in the immediate vicinity of them. The first one turned up quite unexpectedly when I threw a piece of timber up amongst the branches of an oak tree. After this, beating with a long pole was responsible for the remaining captures, with the exception

of two at Mucklestone (Staffs) on the 18th June, 1932. On this occasion I saw a *fulviceps* resting on a grass stem near a tall oak, but before I could get near enough to net it, it flew up to the top branches of the tree. Later, on the same day, I found two more on grass stems similarly situated. These had recently emerged, and were quite teneral, for although the wings had developed, they had the usual clouded appearance one sees in teneral Chrysopidae.'

It thus appears that the natural habitat of *N. fulviceps* in the imaginal and, possibly, the larval stages is the upper branches of oaks, and it may be on this account that so few examples have hitherto been taken; its rarity may be more apparent than real.

It has been recorded from the following counties, in addition to those given above: Bedfordshire, Berkshire, Devonshire, Durham, Gloucestershire, Hampshire, Kent, Lincolnshire, Yorkshire.

Abroad, it has a wide distribution in Europe, occurring from Spain and Bulgaria in the south to Scandinavia and England in the north.

Oviposition and Description of Egg.

The following notes on the egg stage are drawn up mainly from information supplied by Mr. Burrows.

Of five females taken, only one carried a white spermatophore; this insect died without ovipositing after being kept for four days. Two of the remaining females laid fertile eggs after some seven or eight days in captivity, but both were without any trace whatever of having carried a spermatophore externally on the abdomen.

Eggs are laid singly, *i.e.* not in a united cluster as in *Chrysopa flava* (Scop.) and *C. flavifrons* Brauer. The egg is of the usual Chrysopid form, oval in shape, about 1·4 mm. in length and 0·67 mm. in width at its greatest diameter, with a white saucer-shaped micropylar projection, about 0·07 mm. in diameter, at the anterior pole. It is borne on a footstalk from 6 to 7 mm. in length. Withycombe (1923) describes the footstalk in *N. capitata,* in the case of all eggs from vigorous females, as 'knotted at regular intervals, or moniliform, as though it had been drawn out in a succession of jerks.' In all the eggs of *N. fulviceps* which have been seen, the footstalk has been slender and simple; but as eggs of *N. capitata* obtained by Mr. Burrows from females in captivity have also shown simple stalks, it is probable that the conditions of captivity may have caused the females to have become somewhat exhausted before oviposition took place.

The chorion is smooth. When first laid the egg is pale yellowish-green in colour, but after twenty-four hours the colour changes to bluish-green, and about seven days later, when embryonic development has considerably advanced, becomes

grey, the eyes showing through the chorion as dark dots. The micropylar projection remains conspicuously white.

Hatching occurs in twelve to fifteen days (end of June).

The Larva (Pl. II).

After hatching, the larva rests on the empty shell for several hours.

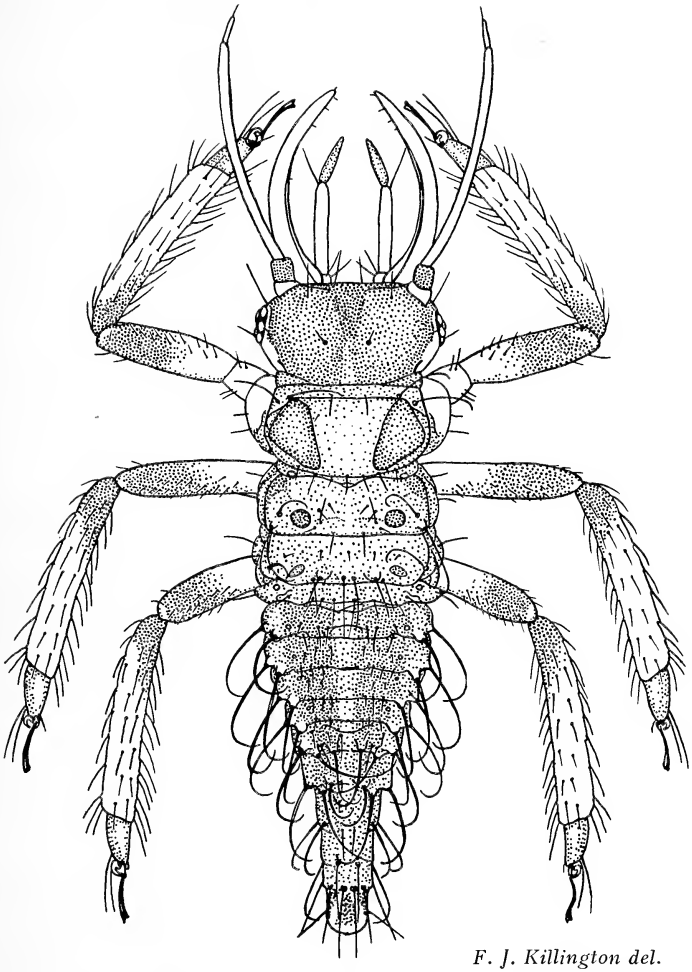
The following description of the first instar larva is based on specimens a few hours old preserved in spirit.

Head transverse; anterior margin almost straight, sides of head diverging until the eyes are reached and then converging rather rapidly towards the posterior margin. Dorsal surface mainly pale yellowish-brown or yellowish-fuscous. On either side a conspicuous clear whitish streak borders the eyes above, and then widens and bends to run parallel with the sides of the head to the posterior margin. An indistinct pale line (the epicranial suture) runs from the centre of the posterior margin to about the middle of the head, but the frontal suture is scarcely apparent. The colouring of the head is slightly darker on either side of the pale epicranial suture, also from the junction of the frontal and epicranial sutures to the middle of the anterior margin and along the latter, and just internal to the whitish streaks near the sides of the head; there are, however, no definite dark head markings at this stage. Sides of head, below the eye-level, greyish-brown. Eyes each of six simple elements, placed in a darkly pigmented area just behind the antennal bases. Antennae three-segmented, longer than the jaws; antennal prominences colourless; basal segment short, about as long as wide, fuscous; second segment very long, scarcely tapered, with numerous indistinct transverse thickenings, colourless; third segment also colourless, about one-ninth of the length of the second, tapered, with a fine terminal bristle. Palpi long and slender, shorter than the jaws, mainly colourless; penultimate segment the longest, cylindrical in form, slightly tinged with fuscous at the apex; distal segment much shorter, fusiform, pale fuscous. Jaws appreciably longer than the head, pale yellowish-brown or yellowish-fuscous.

Body pale brown above, palest on the thorax, along the mid-dorsal line of the abdomen and on the last two or three abdominal segments. There is a slight indication of darker latero-dorsal bands on the abdomen. Ventrally the body is cream-white, except at the extreme margins of the abdomen, where it is brown.

Thoracic segments each with a slight dorso-lateral prominence bearing two long blackish curved setae. Latero-dorsal sclerites of the prothorax large, placed rather obliquely, more or less triangular, but with the angles rounded; those of the mesothorax round and much smaller; of the metathorax oval, oblique, and

PLATE II.



F. J. Killington del.

FIRST INSTAR LARVA OF *NATHANICA FULVICEPS* (STEPH.).

slightly smaller than the mesothoracic pair; all three pairs pale fuscous, those of the prothorax paler in the centre.

First abdominal segment with a small lateral prominence on each side bearing one long seta; segments two to seven (inclusive) with more strongly developed, bi-tuberculate, lateral prominences, each tubercle with a long curved seta. Other setae, many with their apices recurved and hook-like, are placed in transverse rows on the thorax and abdomen, and are particularly numerous on the abdomen. It seems probable, therefore, that in nature débris would be carried in at least the first instar.

Legs shaded with fuscous on the distal portion of the femora and basal portion of the tibiae, so that the knees are dark; tarsi somewhat fuscous; elsewhere the legs are translucent and colourless. Claws strongly curved, with an internal rounded expansion basally. Empodium long, trumpet-shaped and blackish.

No description of the later instars can be given. Judging from the appearance of the first instar larva, it seems probable that the full-grown larva resembles that of *N. capitata* in having the lateral setigerous prominences weakly developed on the thorax and most strongly developed on the second to the seventh segments of the abdomen.

Mr. Burrows informs me that he has succeeded in keeping a few larvae alive for a time, and one pupated within a silken cocoon on the 14th August. Unfortunately he had no opportunity to describe the second and third instars. The larvae took readily to a mixed diet of aphides from rose, poplar, cabbage and dock. They rarely carried any débris, but Mr. Burrows considers that this may have been due to an insufficient supply of aphides.

N. fulviceps appears to be single-brooded, and imagines have been taken in June, July and August.

Reference.

Withycombe, C. L. 1923. Notes on the Biology of some British Neuroptera (Planipennia). *Trans. Ent. Soc. Lond.*, **1922**: 501–594.

Fredk. J. Killington.

Fauna of Cambridgeshire.

We have received from Mr. G. C. Varley, Curator of the Cambridge Natural History Society, University Museum of Zoology, Cambridge, the following communication which is of interest to students of British Entomology:

'The Cambridge Natural History Society has collected records of the animals found in the County, and these are filed and kept for reference in the Insect Room in the University Museum of Zoology, Cambridge. From these files, and from personal observations by the authors concerned, the following fauna lists have been published by the Society:

"Dermaptera and Orthoptera of Cambridgeshire," by E. B. Worthington (1928); "The Spiders of Cambridgeshire (Including Harvest Spiders and Pseudoscorpions)," by W. S. Bristowe (1929); "The Bees, Wasps and Ants (Hymenoptera Aculeata) of Cambridgeshire," by G. M. Spooner (1930).

Copies of these may be obtained (price 2/- each) on application to the Curator. At the same time attention may be called to "The Natural History of Wicken Fen," edited by Prof. J. Stanley Gardiner (1932), in which there are various articles on insects.' EDITORS.

Early appearance of Vanessa cardui L. (Lep.) in the Isle of Man.

On the fine, sunny morning of 24th March, 1935, I observed a specimen of the painted lady butterfly flying about and sunning itself in a rock garden of a house on the outskirts of Douglas, Isle of Man. It settled within two yards of me, and I could see that although rather dull in colour it was quite uninjured.

As the earliest note I have of *Vanessa cardui* in the island previously is on 28th May, it seems almost certain that this specimen must have spent the winter in hibernation. The fact that I did not see a single *Vanessa cardui* during the whole of last season must, however, also be taken into consideration.

W. S. COWIN.

Sziladynus montanus Meig. (Dipt., Tabanidae) in the north of England.

Mr. Audcent in his note on this species (1935, *J. Soc. Brit. Ent.*, **1** (3): 90) states that this species must surely be awaiting capture in the north of England. It is already on record from Yorkshire, having been taken in the following localities: Austwick, 17.vii.21, and Pilmoor, 27.vi.20, C. A. Cheetham (*Naturalist*, **1921**: 411); Askham Bog, York, 20.vi.25, C. A. Cheetham (*Naturalist*, **1925**: 283); and Pen-y-ghent, 2.vii.30, F. W. Edwards and C. A. Cheetham (*Naturalist*, **1930**: 396). It is also recorded from Holker Moss, Lancashire, 6.vi.22, J. D. Ward (1925, *Lancs. Chesh. Nat.*, **17** (2): 93). The late Rev. W. J. Wingate in his list of Durham Diptera (1906, *Trans. Nat. Hist. Soc. Northumb.* (N.S.) **2**: 99) gives 'Waskerley, 1 ♀, 5-7-01' and adds 'I am not at all sure of this identification.'

WM. J. FORDHAM.

SOCIETY FOR BRITISH ENTOMOLOGY

List of Publications for Sale at the Nett Prices shown.

(All prices are post free.)

SYSTEMATIC WORKS.

British Hemiptera-Heteroptera. By H. P. Jones, 1930. 88 pp., 2 Pls. 4*s.* 6*d.*

British Neuroptera. By F. J. Killington, 1929. 36 pp., 6 Pls., 6 Figs. 4*s.* 0*d.* With Supplement (*Hemerobius*), 1934, 5*s.* 6*d.*

British Tabanidae (Dipt.). By E. R. Goffe, 1930. 71 pp., 2 Pls. 5*s.* 0*d.*

British Tipulinae (Dipt.). By H. L. F. Audcent, 1932. 35 pp., 3 Pls. 4*s.* 0*d.*

Keys to British Asilidae (Dipt.). By B. M. Hobby, 1932. 6 pp. 1*s.* 9*d.*

Meigen's 'Nouv. Class.' 1800. By E. R. Goffe, 1932. 7 pp. 1*s.* 0*d.*

British Liriopeidae (Dipt.). By H. L. F. Audcent, 1934. 12 pp., 4 Pls. 1*s.* 9*d.*

British Mecoptera (Synopsis and Feeding Habits). By B. M. Hobby and F. J. Killington, 1934. 11 pp., 2 Pls. 1*s.* 6*d.*

FAUNAL LISTS.

Tortrices of Hants and I.O.W. By W. Fassnidge, 1929. 20 pp. 1*s.* 6*d.*

Macro-Lepidoptera of Hants and I.O.W. By W. Fassnidge, 1925. 42 pp. 1*s.* 6*d.*

Hymenoptera Aculeata of Hants and I.O.W. By H. P. Jones, 1926. 13 pp. 1*s.* 0*d.* With Supplement, 1932, 1*s.* 6*d.*

Paraneuroptera of Hants and I.O.W. By F. J. Killington, 1926. 9 pp. 1*s.* 0*d.*

List of British Collembola. By F. A. Turk, 1933. 6 pp. 1*s.* 0*d.*

List of Dorset Lepidoptera. By W. P. Curtis. Introduction and Part I, 1934. 102 pp. 7*s.* 6*d.*

Other Faunal Lists no longer available as separates will be found in the Transactions and Journal.

GENERAL WORKS.

'Entomology and Ethics.' By W. Fassnidge (Presidential Address, 1931), 1932. 16 pp. 1*s.* 0*d.*

Bibliography of Entom. Notes in Publications of British Local Societies. (An indispensable Supplement to the Zoological Record.)
Part I, 1933. 24 pp. 2*s.* 6*d.*
Part II, 1934. 18 pp. 2*s.* 6*d.*

SERIAL PUBLICATIONS.

ENT. SOC. S. ENGL.

THE JOURNAL.

Parts I–IV, 1932–33 (in all 112 pp., 1 Pl.). 2*s.* 6*d.* each.

THE TRANSACTIONS.

No. IV,	1928	4*s.* 0*d.*
No. V,	1929	7*s.* 6*d.*
No. VI,	1930	*out of print.*
Vol. VII,	Part 1, 1931 ...	7*s.* 0*d.*
Vol. VII,	Part 2, 1932 ...	10*s.* 6*d.*
Vol. VIII,	Part 1, 1932 ...	8*s.* 0*d.*
Vol. VIII,	Part 2, 1933 ...	7*s.* 0*d.*

Transactions Nos. 1—3 were issued by the Hampshire Entomological Society and are out of print. Copies, however, are sometimes available, and particulars of any on hand may be had on request.

SOC. BRIT. ENT.

THE JOURNAL.

Vol. I, Part 1, May, 1934	...	2*s.* 6*d.*
Vol. I, Part 2, Oct., 1934	...	2*s.* 6*d.*
Vol. I, Part 3, April, 1935	...	2*s.* 6*d.*

THE TRANSACTIONS.

Vol. I, Part 1, June, 1934. 102 pp., 9 Pls. 10*s.* 6*d.*

Vol. I, Part 2, Nov., 1934. 184 pp., 10 Pls. 12*s.* 0*d.*

The list of Contents of any Volume will be sent on request.

The Subscription to the Society, which includes copies of all matter published during the period covered, is 21*s.* 0*d.* per annum. There is no entry fee.

Orders, accompanied by the appropriate remittance, should be addressed to **E. Rivenhall Goffe,** Hon. Sec., 102, High Street, **Southampton.**

.S66

VOL. 1. PART 5.

JOURNAL
OF THE
SOCIETY FOR BRITISH ENTOMOLOGY

EDITOR:
F. J. KILLINGTON, B.Sc., A.L.S., F.R.E.S.

ASSISTANT EDITOR:
B. M. HOBBY, M.A., D.PHIL., F.R.E.S.

SMITHSONIAN INSTITUTION
APR 6 1936
NATIONAL MUSEUM

DATE OF PUBLICATION: 24TH MARCH, 1936.

Copies may be purchased from the Secretary at 102, High Street, Southampton.

Price 2s. 6d., post free.

CONTENTS.

PAGE

ALLEN, J. W.: *Epistrophe balteata* de Geer (Dipt., Syrph.) hibernating 118

ANDREWES, H. L., F.R.E.S.: Honey-combs as a Bait for Moths 141

BLOOD, B. N., M.D., L.R.C.S.I., L.R.C.Ph.I.; and KRYGER, T. P.: *Petiolaria anomala* Bl. & Kr. (Hym., Chalcid.): description of the female 115

BOYD, D. O., B.Sc., D.I.C.: Two examples of unusual behaviour in Bombidae (Hym.) 129

———— *Bombus subterraneus* L. (=*latreillellus* Kirb.) (Hym.) at Botley, Hants 130

———— Male *Stylops aterrima* Newport (Strepsiptera) in Surrey 130

———— *Anthonomus rubi* Herbst. (Col., Curculionidae) visiting flowers of *Bellis perennis* L. 131

BROWN, J. M., B.Sc., F.L.S., F.R.E.S.: Further note on the possible occurrence of *Ecdynurus forcipula* (Pict.) (Ephem.) in Britain 118

CALLAN, E. McC.: A note on some Hymenoptera bred from a dead willow 128

CAPENER, A. L.: *Sphinx convolvuli* L. (Lep.) in Dorset, 1935 120

CARPENTER, G. D. H., D.M., F.L.S., F.R.E.S.: Notes on larvae and pupae of *Polygonia c-album* Linn. (Lep.) 146

CHAMBERS, V. H.: A new locality for *Hylaeus* (=*Prosopis*) *cornuta* Smith (Hym., Hylaeidae) 127

———— Notes on *Hylaeus hyalinata* Smith (Hym., Hylaeidae) 127

———— *Polygonia c-album* L. (Lep.) in Bedfordshire .. 128

CURTIS, W. P., F.R.E.S.: Blackbird attacking Lepidopteron 120

———— *Synia musculosa* Hübn. (Lep.) in Hants 121

———— *Danaus plexippus* Linn. (Lep.) in Hants 121

DANNREUTHER, T., Capt., R.N., F.R.A.S., F.R.G.S., F.R.E.S.: *Vanessa cardui* (Linn.) (Lep.) in January 145

(*Continued on page 3 of cover.*)

JOURNAL OF THE SOCIETY FOR BRITISH ENTOMOLOGY

VOL. I. 24TH MARCH, 1936. PART 5.

Petiolaria anomala Bl. & Kr. (Hym., Chalcid.): description of the female.

Head and thorax light brown, eyes black, abdomen darker brown, petiole and legs light yellow, at each tarsal articulation a narrow dark ring, last tarsal segment lighter than the preceding four. Antennae brown. Tegulae black.

Head, thorax, surface and underside of forewings and first segment of petiole reticulated; in the wings the reticulation reminds one of crocodile-skin and does not correspond with any lines of neuration.

Antennae long and slender, 10-segmented: scape, pedicellus, 7 funicle segments and an entire club. Scape long, pedicellus pear-shaped, a little more than one-third the length of scape, segments of funicle narrow, slender, increasing in length towards apex, but the seventh a trifle shorter than the sixth and slightly curved. Club long, oval, without any trace of articulation. The whole antenna very sparingly provided with hairs and sense organs.

Forewings as in the male. Slight traces of a short venation are to be seen near the wing-root. It is rather difficult to make a correct drawing of the forewing, because it is strongly curved and concave. Some parts of the reticulation seem to be more conspicuous than the rest. Hindwings short and rudimentary, without venation and surface hairs; at apex with two hooks and the anterior margin with two rather long and strong bristles. Legs as in the male.

It is difficult to tell anything about the relative position or size of the abdominal segments. The specimens mounted in balsam have all the segments of the abdomen drawn into the first one. Six segments may be seen. Ovipositor short and inconsiderable, slightly protruding.

Petiolaria in behaviour much resembles *Mymar*. Its gait is very stiff and the insect walks with the wings raised about thirty degrees over the body, the concave sides towards each other. *Mymar* also walks with its wings raised in a similar manner.

Our first specimen of the genus was swept in a lane in Brockenhurst, in the New Forest, in grasses below some oaks on a stormy day, and we were inclined to believe that the insect

had been blown down from the trees. Though we have swept in the same place many times both in that summer (1921) and also in the following years, we have had no success in getting more specimens. Great was my (T. P. Kryger) surprise when sweeping in the peat-fen Holmegaards Mose on 3rd August, 1934, in the southern part of Seeland, I found a small fly in the bag which I did not know, and this fly on a closer microscopical examination proved to be the long-searched-for female *Petiolaria anomala*. Later on, 8th August, 1934, I swept a male in the peat-fen Salpetermosen, near Hillerod, North Seeland. Both the Danish specimens were swept from grass along small paths near low willows. It may then be likely that the insect is a parasite of some insect eggs placed in or upon grasses or low herbage, but as the ovipositor is very short it must be supposed that the host eggs cannot be very deeply embedded in the plant.

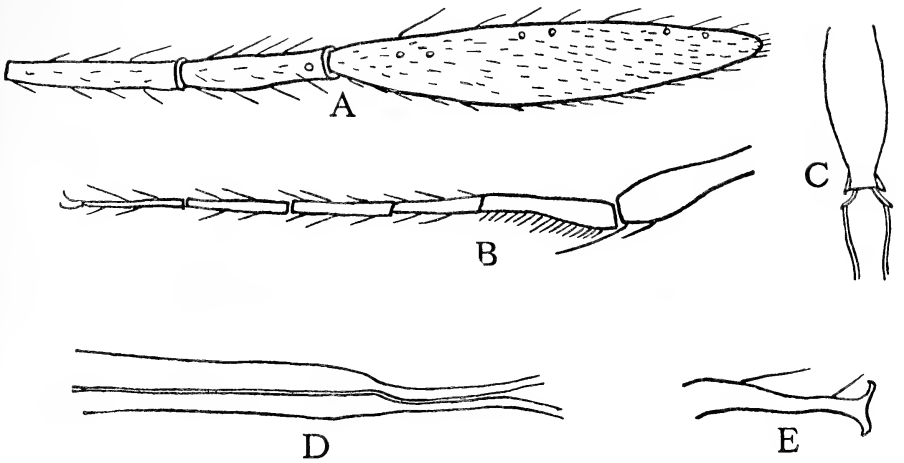
Hab. : Denmark, Holmegaards Mose, Seeland.
Date : 3rd Aug., 1934.
♀ Type (1 spec.) in the British Museum.

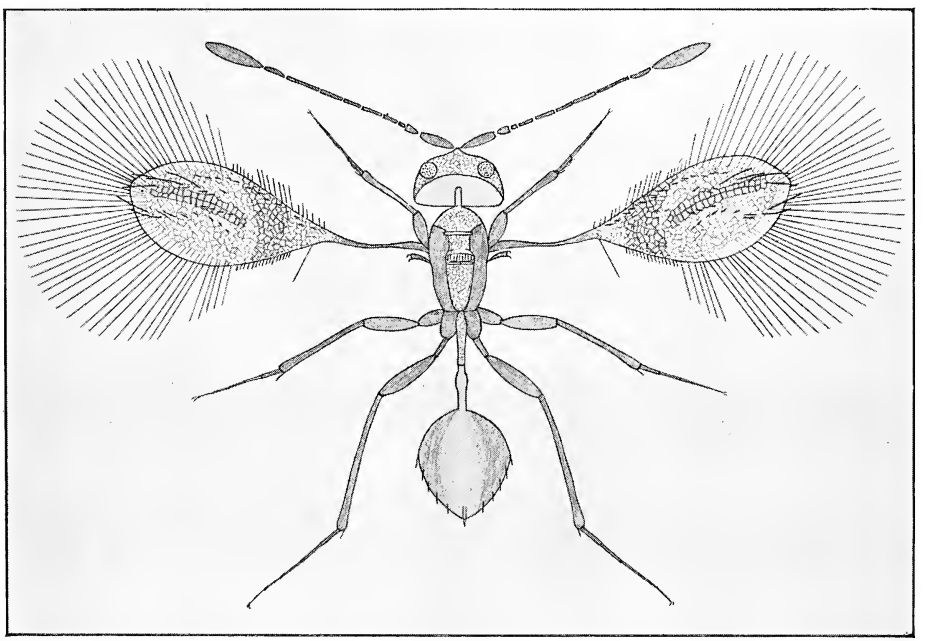
B. N. Blood and T. P. Kryger.

Note on Aeshna cyanea (Müll.) (Odonata).

Over a small rushy pool at Badbury Rings, near Wimborne, I watched recently a small swarm of *Aeshna cyanea*. There were at least twenty males and three or four females at any one time over this pond, and the competition for the females was so great that the bullied insects, when leaving the pond, instead of flying off to the near forest, sought refuge in little hollows on the clay banks beside the pond. They first alighted on thistles and then insinuated themselves between these and the earthy bank. In such confined spaces it was difficult for them to extricate themselves quickly, and it was quite easy to catch them by hand. Their behaviour was unique in so far as my experience goes. I took three good specimens and then, wishing to see if I could attract the males, went to the edge of the pond and held one of the females out. Almost instantly a male sprang upon it and, struggling on my hand, attempted to copulate with it. This was repeated several times by individual males. I then took a female from my cyanide bottle and placed its corpse on a log lying at the edge of the water. Almost instantly a male descended upon it and, struggling furiously with the corpse, much to my astonishment, succeeded in seizing it by the neck with its anal appendages and then rose and flew heavily off to a neighbouring oak. It changed its resting-place three times, obviously puzzled at the negative behaviour of its mate, and then settled down for a full half-hour. I then put it up by throwing a stick at it. It rose and flew a hundred yards with the corpse of the female trailing helplessly beneath it and

PLATE III.





F

T. P. Kryger del.

PETIOLARIA ANOMALA Bl. & Kr., ♀ (Hym., Chalcid.).

A.—Antennal club. B—Foretarsus. C.—Connection between the two segments of petiole. D.—Base of forewing. E.—Hindwing. F.—Imago.

settled on a hawthorn. On putting it up from there, it flew in a wide circle and disappeared into the forest, and I saw it no more.

It would seem from this that the initial copulatory act in the Odonata is entirely passive in so far as the female is concerned and that the male needs no assistance in performing it.

F. C. Fraser.

Anax imperator Leach copulating with Cordulegaster boltonii (Don.) (Odonata).

On 20th July this year, at Coy Pond, Bournemouth, I saw a female *Cordulegaster boltonii* crossing the water. It was set upon by two males of *Anax imperator* and beaten down into the water, from which, after a momentary confusion of wings, one of the latter rose copulated with the *Cordulegaster*. At first I thought that I had mistaken the latter for a female *A. imperator,* as they do not look dissimilar on the wing at a good distance. I watched the pair flying round for some five minutes, the female trailing in a peculiarly helpless manner from the male, its abdomen swinging right and left at every turn. Presently they came in my direction, and running along the bank I succeeded in taking the two in my net still attached; the male quickly released the *Cordulegaster,* however. I found that my first surmise was correct and that an *Anax* had actually copulated with a female belonging to a widely removed genus. I believe that this is a first record of these two species copulating; it is interesting to note that the female made no attempt to consummate the act.

F. C. Fraser.

Immigration of Aeshna mixta Latr. (Odonata) in 1935.

13th August, 1935. Big immigration arrived overnight at Bournemouth on the morning of which great numbers were seen flying in the Gardens near the coastal end. All taken were subadult and females had empty oviducts (undeveloped ova).

14th August. Day cloudy and dull. None seen.

15th to 17th August. Plenty of both sexes on the wing. All flying high and rather difficult to capture. On the wing I was struck by their extraordinary resemblance to *Anaciaeshna jaspidea* (Burm.).

18th August. A pair taken sleeping on a low bush in the Gardens.

19th August. Several specimens taken in ridings in the New Forest.

20th August. Several seen flying near sea at Milton-on-Sea.

21st August. A male seen hawking for some time on border of cliff at Swanage.

4th September. Several males hawking over Keston Pond, Kent.

F. C. Fraser.

Chrysopa dorsalis Burm. (Neuropt.) in Hants.

A single male of this species was taken at Rhinefield, New Forest, on 19th June, 1935. It has been determined by K. J. Morton. F. C. Fraser.

Odonata on the Elan-Ystwyth Pass (Cardiganshire).

The following dragonflies were met with during the August Bank Holiday week-end by my friend, Mr. N. H. Glegg, and myself in the neighbourhood of some small peaty pools at the summit of the Elan-Ystwyth Pass in Cardiganshire: *Libellula quadrimaculata* Linn., *Sympetrum danae* (Sulz.), *Aeshna juncea* (Linn.), *Agrion virgo* (Linn.), *Lestes* sp. and *Pyrrhosoma nymphula* (Sulz.). J. Stainer.

Epistrophe balteata de Geer (Dipt., Syrph.) hibernating.

The following notes supplement the observation recorded by E. R. Goffe in 1934, *J. Soc. Brit. Ent.*, **1** (2): 47-48.

On 15th January, 1935, I took a single specimen of this species which was flying and settling on some honeysuckle under the glass roof of the verandah of my house at Camberley, Surrey.

On 5th February, 1935, this species appeared in numbers, both under the glass verandah and visiting the flowers of species of *Crocus*.

All the individuals examined were somewhat faded.

J. W. Allen.

Further note on the possible occurrence of Ecdynurus forcipula (Pict.) (Ephem.) in Britain.

In their note on the distribution of what we believe to be the nymph of the above-mentioned species of may-fly, Messrs. W. D. Hincks and J. R. Dibb (1935, *J. Soc. Brit. Ent.*, **1** (3): 76) mention that I have captured this nymph in the Sheffield district and in Derbyshire. As this is not quite correct, I here give a list of the localities where I have taken it up to date :—

R. Bradford (Youlgreave), Derbyshire, on various dates between May, 1930, and August, 1935.

R. Dove (between Thorpe and Mapleton), Derbyshire, July, 1934.

Stream flowing from Combe Scar (Dent), north-west Yorkshire, June, 1933.

R. Skell (Ripon), mid-west Yorkshire, August, 1933.

Goredale Beck (Malham), mid-west Yorkshire, July, 1935.

Thus the nymph seems to be widely distributed, at any rate in the north. It generally appears to be in company with that of *E. venosus* F., and on no occasion have I found it in large num-

bers. The life-history of the species probably runs through two seasons at least, as nymphs of very small size (probably of the first or second instar) were taken along with others apparently about half grown, during July. This also suggests June as the month of emergence of the fly, and, further, nymphs which appeared almost ready for emergence have been taken in early June.

JAMES M. BROWN.

Further records of Coccidae (Hemipt.) from Hants.

The three following species of Coccidae were taken in the New Forest during the first week of August, 1935:—

Aspidiotus bavaricus Lindinger, on stems of *Erica cinerea* Linn., at Beaulieu Road;

Eriopeltis festucae (Fonsc.), on grass (*Festuca ovina* Linn.) beneath trees, at Lyndhurst Road;

Eriococcus devoniensis (Green), on stems of *Erica tetralix* Linn., at Beaulieu Road.

Red currant bushes in my garden at Southampton were badly infested this summer with *Pulvinaria vitis* (Linn.), and this Coccid later spread to gooseberry bushes, although the infestation in this case was not so severe.

FREDK. J. KILLINGTON.

Deilephila galii Rott. (Lep., Sphingidae) in Berks.

In 1933 (*J. Ent. Soc. S. Engl.*, **1** (4): 81) I reported the occurrence of this insect in Berkshire feeding on *Epilobium*.

As it seems now to have disappeared as suddenly as it appeared, the following notes may be of interest.

The last emergence in the autumn of 1933 occurred on 7th October at 5 p.m., and the process of drying the wings took one and a half hours. The first emergence after the winter took place on 30th May (slightly deformed) and the other emergences occurred between 20th June and 9th July.

Of the pupae I had in my charge about forty-five per cent. emerged in the autumn, forty-five per cent. after the winter and the remaining ten per cent. either failed to emerge or were hopeless cripples.

During 1934 larvae were again found, though in rather fewer numbers (about two dozen). On 27th June some were found nearly full-fed and others quite small (second or third moult). The very small larvae (before the spots develop) may be distinguished from those of *D. elpenor* Linn. at the same stage by having three pale yellow lines, one along the back and the other two just above the spiracles.

Emergence from these occurred in September, 1934, and between 27th June and 7th July, 1935.

Some of the 1934 larvae were attacked by the Tachinid *Compsilura concinnata* Mg. (kindly identified by Dr. K. G. Blair). Whilst collecting larvae in 1933, I showed them to a gardener who works in the district, and he told me that he had certainly come across them in 1932, and had put eight or nine of them 'under the heel.'

As the full-fed larva is such a striking insect, I am convinced in my own mind that this insect has been in this neighbourhood for three consecutive seasons. All the localities in which it was taken lie within a circle of a quarter of a mile radius.

This year (1935) I have been unable to find, or hear of, any trace of *D. galii*. The only reasons I can suggest to account for its absence this year are :—

(1) The severe frost on and about 17th May, which decimated the fruit crop, and caught the fruit trees in this district.

(2) The deterioration of the *Epilobium*, where the *galii* were originally found; for the heather, which had been burnt about 1930, is now growing up and getting the better of the *Epilobium*; but, on the other hand, the food-plant by the roadside appears as good as formerly.

E. M. Eustace.

Sphinx convolvuli L. (Lep.) in Dorset, 1935.

It may be of interest to record the capture of a specimen of the Convulvulus hawk-moth at Osmington on 25th September.

A. L. Capener.

Blackbird attacking Lepidopteron.

At More Crichel, Dorset, a male blackbird (*Turdus merula merula* Linn.) was observed to chase a small moth out of long grass beside the road. The moth appeared to be either *Crambus tristellus* Fabr. or possibly *Crambus selasellus* Hübn. or might even have been a bleached and worn *Nomophila noctuella* Schiff. After a few seconds' rather clumsy manoeuvring, the insect was beaten down on to the road surface, and swallowed whole. I remarked to Mr. W. Fassnidge that I had not previously seen a blackbird attack a Lepidopteron and suggested shortness of food due to the prolonged drought as a possible explanation. Since the observation, which was made on 11th August, 1935, Mr. C. L. Collenette has sent me his paper, 'Notes concerning attacks by British birds on butterflies,' 1935, *Proc. Zool. Soc. Lond.*, **1935**: 201-17. This records at p. 213 two blackbird attacks on butterflies.

W. Parkinson Curtis.

Synia musculosa Hübn. (Lep.) in Hants.

A further occurrence of this species (*cf.* 1934, *J. Soc. Brit. Ent.*, **1** (1): 9) is reported to me by Mr. Leslie F. Burt, of New Milton. It came to light on 25th July, 1935, at 'Great Ballard,' New Milton, and was captured by Mr. E. Kefford and determined by Mr. Burt.

W. Parkinson Curtis.

Danaus plexippus Linn. (Lep.) in Hants.

Mr. Leslie F. Burt reports this species at Ashley, New Milton, on 17th July, 1935.

The persistence with which this insect recurs in Britain in a climate entirely unsuitable to *Asclepias* is extraordinary. According to the manuals of gardening the members of the genus are incapable of withstanding our winter climate unprotected, and those members of the order Asclepiadiaceae with which I have any acquaintance are mainly stove or greenhouse plants. There appears to be no plant in Britain that forms a possible substitute food-plant, except perhaps *Vinca major* Linn., which is the nearest ally, but belongs to a different order of plants.

W. Parkinson Curtis.

Synonymic notes on the genera Chloroperia, Isopteryx and Isoperla (Plecoptera), with a list of the British species of Chloroperla.

Amongst European entomologists, there exists a difference of opinion concerning the application of the names *Chloroperla, Isopteryx* and *Isoperla,* the last name having found its way into the list of British Plecoptera owing to the action of Lucas (1932, *Entomologist,* **65**: 41).

The genus *Chloroperla* was proposed by Newman (April, 1836, *Ent. Mag.,* **3**: 500). He gives characters separating it from *Perla, Isogenus* and *Nemoura* and says that there are several species inhabiting Britain, mentioning by name *Chloroperla viridis* (Fabr.), *Chl. lutea* (Latr.), and *Chl. apicalis* Newman, described in that paper. Of the last species he says: 'It is a most transparent, delicate little creature.'

Stephens also mentions *Chloroperla* Newm. (1836, Ill. Brit. Ins., Mand., **6**: 137), four months later than the original description. He lists seven species, including *Chl. flava* (Fourc.) (=*Chl. viridis* (Fabr.), one of the original species).

In 1839 Newman dealt more fully with the genus (*Mag. Nat. Hist.,* N.S., **3**: 86), dividing it into two groups, '*Species aberrantes*' and '*Species normales.*' Amongst the former he places *Chl. grammatica* (Scop.), and amongst the latter *Chl. flava* (Fourc.) (with *Chl. viridis* (Fabr.) and *Chl. lutea* (Latr.) as synonyms) and *Chl. apicalis* Newman.

Westwood in 1840 (Gen. Synops. Brit. Ins.: 47, in Introd. Mod. Class. Ins., **2**) quotes *Perla lutea* Latr. as the typical species of the genus *Chloroperla* Newm.

Pictet (1841, Hist. Nat. Ins. Névr., Fam. Perlides: 145) differs in his interpretation of *Chloroperla* Newman, remarking in a footnote ' Tout en adoptant comme sous-genre le genre Chloroperla de M. Newman, je l'ai caractérisé un peu différemment,' and gives as types ' *Perla rivulorum, virescens,* etc.' Neither of these species is in the original description, and this fixation is consequently invalid. He also describes a new genus *Isopteryx* (p. 146), giving as type *Perla flava* Fourc., and including in this genus all the original species of *Chloroperla* Newman.

Banks (1906, *Ent. News,* **17** : 174) rightly points out that *Isopteryx* Pictet is synonymous with *Chloroperla* Newman and that *Chloroperla* of Pictet and subsequent authors is without a name. This latter genus he has divided into two, *Isoperla* (type, *Perla bilineata* Say) and *Alloperla* (type, *Perla imbecilla* Say), but does not mention a genotype for *Chloroperla* Newman.

Enderlein (1909, *Zool. Anz.,* **34**: 388), who was apparently unaware of Westwood's genotype selection, gives *Chl. apicalis* Newm. as genotype, and he is followed by Needham and Claassen (1925, Plecopt. N. Amer., **2**: 127).

Chloroperla lutea (Latr.) appears to be generally considered as a synonym of *Chloroperla tripunctata* (Scop.), so that the genotype of *Chloroperla* Newman may be cited as *Phryganea tripunctata* Scopoli, 1763 (=*Perla lutea* Latreille).

Thus it seems that there is no way of avoiding the change in generic names, and the name *Chloroperla* as understood by British entomologists should give place to *Isoperla* and *Isopteryx* should become *Chloroperla*. Some confusion is inevitable at first, but as confusion has already existed between European and American workers for the last thirty years, that can scarcely be put forward to support the conservation of the names *Chloroperla* auct. *nec* Newman, and *Isopteryx* Pictet.

CHLOROPERLA Newman, 1836.

GENOTYPE: *Phryganea tripunctata* Scopoli, 1763 (=*Perla lutea* Latreille).

Chloroperla Newman, April, 1836, *Ent. Mag.,* **3**: 500.
,, Stephens, Aug., 1836, Ill. Brit. Ent., Mand., **6**: 137.
,, Newman, 1839, Mag. Nat. Hist., N.S., **3**: 86.
,, Westwood, 1840, Syn. Gen. Brit. Ins.: 47 in Intro. Mod. Class. Ins., **2** (genotype, *Perla lutea* Latr.).
,, Banks, 1906, *Ent. News,* **17**: 174.
,, Enderlein, 1909, *Zool. Anz.,* **34**: 388 (genotype, *Chloroperla apicalis* Newm.).

Chloroperla Needham and Claassen, 1925, Plecopt. N. Amer., **2**: 127.

,, Lucas, 1932, *Entomologist,* **65**: 41.

Isopteryx Pictet, 1841, Hist. Nat. Ins. Névr., fam. Perlides: 146 (genotype, *Perla flava* Fourc.).

,, Banks, 1906, *Ent. News,* **17**: 174 (syn. of *Chloroperla* Newm.).

ISOPERLA Banks, 1906.

GENOTYPE: *Sialis bilineata* Say, 1823.

Isoperla Banks, 1906, *Ent. News,* **17**: 175 (genotype, *Perla bilineata* Say).

,, Enderlein, 1909, *Zool. Anz.,* **34**: 390.

,, Needham and Claassen, 1925, Plecopt. N. Amer., **2**: 144 (genotype, *Sialis bilineata* Say).

,, Lucas, 1932, *Entomologist,* **65**: 41.

Chloroperla Pictet, 1842, Hist. Nat. Ins. Névr., fam. Perlides: 145.

There now remains the question: 'What are the British species of *Chloroperla?*' Lucas (1932, *Entomologist,* **65**: 41) lists only two, *Chloroperla torrentium* Pict. and *Chl. tripunctata* Scop. Dale's list (1907, Cat. Brit. Orth., Neur., Trich.) also records these two species only. Newman's species, *Chl. apicalis,* is entirely ignored, although a species is recognised on the Continent under the name of *Isopteryx apicalis* Newm.

The types of Newman's species are now in the Hope Department at Oxford, and through the kindness of Prof. G. D. H. Carpenter I have been permitted to examine them. There are three specimens (without locality labels) labelled 'Chloroperla apicalis Newman. Det. in Coll. Ent. Club. Inst'd. 1826. Fr. Stevens sale, 13 Mar. 1928. Lot 329.' Only one example now possesses an abdomen, and that is a female. This specimen I have selected as the lectotype. The margin of the eighth sternite is entirely distinct in form from that in either *torrentium* or *tripunctata,* being less produced and more chitinised. I have examined all the British material of this genus in the Museum collections, but I have not discovered any examples of *apicalis.* Newman records that it 'abounds in Herefordshire, frequenting the alders by the sides of the trout streams.' He also adds in a footnote that it is also common in like situations near Nantes in France.

I have examples of *Chl. apicalis* Newm. collected by Mr. M. E. Mosely at Muret in the Haute Garonne, the females of which agree entirely with Newman's type in the shape of the margin of the eighth sternite. Only one species of this genus was collected at this locality, and thus I can be tolerably certain in associating males with this species. The figure of the supra-

anal hook of *apicalis* ♂ is drawn from a French example. I am figuring all three species in the hope that further specimens of Newman's species will be discovered in Britain.

British Species of *Chloroperla* Newm.

C. torrentium (Pictet), 1842.
Hist. Nat. Ins. Névr., fam. Perlides: 307 (*Perla*).

C. tripunctata (Scopoli), 1763.
Ent. Carniolica: 269 (*Phryganea*).

C. apicalis Newman, 1836.
Ent. Mag., **3**: 501.

There exists a possibility that Newman may have accidentally mixed his British and Continental specimens, and confirmation of the occurrence of *Chl. apicalis* in Britain is very desirable.

D. E. Kimmins
(*Dept. of Entomology, British Museum* (*Nat. Hist.*)).

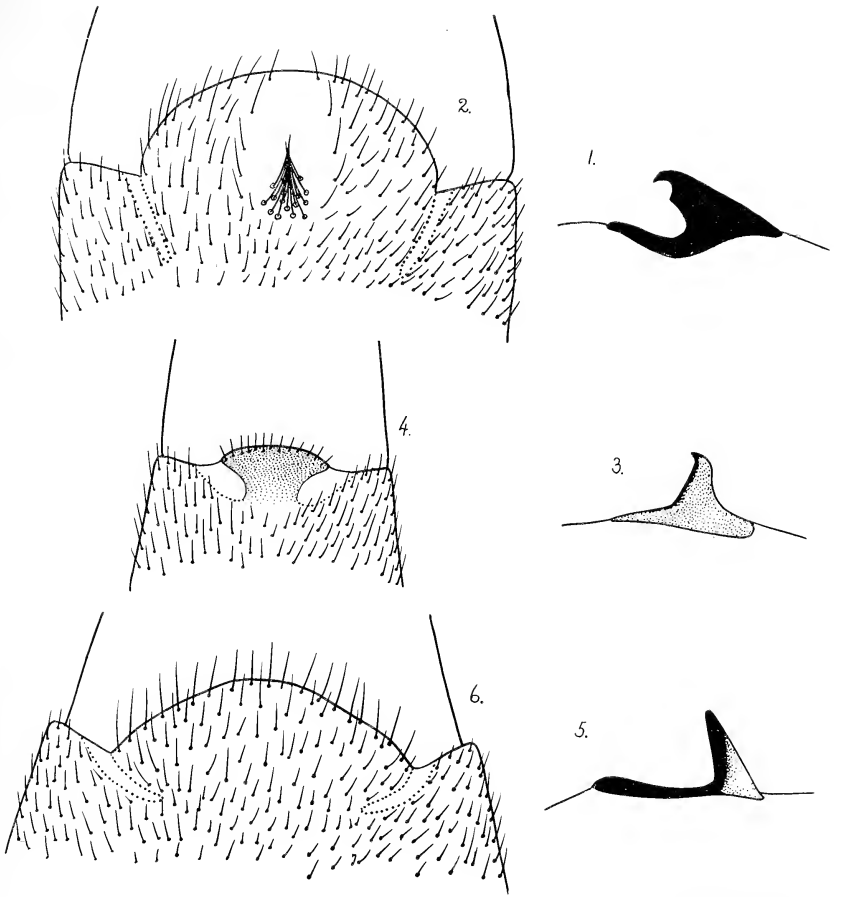
Systematic Note on Two Species of Collyria Schiødte (Hym., Ichneumonidae).

Collyria trichophthalma Thoms. and *puncticeps* Thoms. have not been well understood by authors who have not found the opportunity to study the types. There has been much speculation as to whether the species are really distinct; and as to which of the two, if distinct, is Gravenhorst's species *calcitrator*. I have recently been able to settle these points; and have thought it inadvisable to delay publication of the result, since one of the species concerned has been engaging the attention of economic entomologists for some years.

Through the kindness of Dr. N. A. Kemner, I have been able to examine the types in the Thomson collection in Lund. Thomson's separation of the species (1877: 734-5) should be taken quite literally: in *puncticeps* the vertex is striato-punctate only between and immediately around the ocelli, the remainder of the vertex and the temples are shining and bear well-separated punctures of variable strength; in *trichophthalma* the vertex and temples are completely finely striate. In addition, the female antennae are in *trichophthalma* strongly incrassate, almost clavate, and about as long as head, thorax, and propodeum; in *puncticeps* they are normally incrassate and relatively longer.

Rektor K. Hedwig has been so kind as to examine the type series of *calcitrator* Grav. in the light of the above, and writes as follows: '*Collyria puncticeps* Thms. stimmt mit der Type des *calcitrator* Grv. überein. Unter den 4 ♀ und 3 ♂ der Sammlung Gravenhorst ist *trichophthalma* nicht vertreten.' *C. puncticeps* Thoms. falls, therefore, into synonymy with *calcitrator* Grav.; and *trichophthalma* Thoms. remains a distinct species.

PLATE IV.



D. E. Kimmins del.

BRITISH SPECIES OF *CHLOROPERLA* (NEUROPT.).

FIG. 1. *Chloroperla torrentium* (Pict.), ♂. Supra-anal hook, from left side.

FIG. 2. ,, ,, ,, ♀. Margin of eighth sternite from beneath.

FIG. 3. *Chl. apicalis* Newm., ♂. Supra-anal hook from left side.

FIG. 4. ,, ,, ,, ♀. Margin of eighth sternite.

FIG. 5. *Chl. tripunctata* (Scop.), ♂. Supra-anal hook from left side.

FIG. 6. ,, ,, ,, ♀. Margin of eighth sternite.

The species of economic importance, described in detail by Salt (1931), is *calcitrator* Grav. Of the distribution of *trichophthalma* Thoms. it is not possible to say much. It is clear that Morley (1908) did not know it; and Schmiedeknecht (1907) could only recognise one species of *Collyria* in his Thuringian material, which he supposed to be *puncticeps* Thoms. Thomson (1877) says 'not rare at Ringsjon and Esperöd in Skåne,' and he has a good series in his collection. It is possible that some of the British records of *calcitrator* Grav. should refer to this species; but the only British specimen known to me is a male from Cambridge (22.vi.1905, F. Jenkinson) deposited in the Cambridge University collection.

Synonymy.

Collyria calcitrator Gravenhorst.
Pachymerus puncticeps Thomson.
Collyria puncticeps Schmiedeknecht.
Collyria calcitrator and *puncticeps* Morley.
Collyria calcitrator Salt.

Collyria trichophthalma Thomson.
Pachymerus trichophthalmus Thomson.

References.

Morley, C. 1908. British Ichneumons, **3**. London.
Salt, G. 1931. Parasites of the wheat-stem sawfly, *Cephus pygmaeus*, Linnaeus, in England. *Bull. Ent. Res.*, **22** (4): 479-545.
Schmiedeknecht, O. 1907. Opuscula Ichneumonologica, **3**, fasc. 17. Blankenberg-i-Thüringen.
Thomson, C. G. 1877. Opuscula Entomologica, fasc. 8. Trelleborg.*
* All other fascicles published in Lund.

G. J. Kerrich.

Miscellaneous Records of Parasitism—II.*

The following records of parasitism were accumulated some years ago incidental to work done at the Farnham House Laboratory. The parasites mentioned were kindly determined by Dr. C. Ferrière of the Imperial Institute of Entomology.

1.—Parasites of *Phorbia genitalis* Schnabl.

Puparia of this Anthomyiid fly are frequently found in the soil about the roots of wheat stubble, and in the course of my work on *Cephus pygmaeus* Linn. over seven hundred puparia were collected for me and isolated in small vials by Mr. E. Basden. From these puparia, all of which came from a field near Harpenden, Herts., there were 685 emergents, as follows:—

649 *Phorbia genitalis* Schnabl. (Anthomyiidae).
24 *Hemiteles subzonatus* Grav. (Cryptinae).

* The first note in this series appeared in 1936, *Ent. Mon. Mag.*, **72**: 9—12.

10 *Phaenocarpa pullata* Hal. (Braconidae).
2 *Arthrolytus punctatus* Ths. (Pteromalinae).

The flies were kindly determined for me by Mr. J. E. Collin. 261 males and 388 females emerged. Although this species sometimes causes considerable damage to wheat crops, it seems to have been but little studied and no parasites have previously been reported.

Thinking that the *Hemiteles* might be hyperparasitic on *Phorbia* through the Braconid *Phaenocarpa,* I carefully examined puparia from which it had emerged but failed to find any trace of an intermediate host. It is reasonably certain, then, that *Hemiteles subzonatus* is a primary parasite of *Phorbia genitalis.* The only other known host of *H. subzonatus* (= *crassicornis* Grav.) is the celery fly, *Acidia heraclei* Linn. (Wadsworth, 1915). In my rearings 11 males and 13 females emerged. The female occurs in two forms, one with fully-developed, the other with only minute vestigial wings. Of the thirteen females reared, eleven were macropterous and two brachypterous.

Phaenocarpa pullata Haliday is undoubtedly a primary parasite of *Phorbia genitalis.* I can find no other host records of this species, but several other members of the genus are known to parasitize Anthomyiid flies. Three males and seven females were reared.

Arthrolytus punctatus Thomson emerged from only two puparia. I found the cast skins of the parasite on the recognisable remains of the fly pupa and have no doubt that the chalcid was a primary parasite of the *Phorbia.* No other exact host records are available, although Paillot (1924) reared a species of *Arthrolytus,* perhaps only a dark form of *punctatus,* from a species of *Apanteles.* Other species of *Arthrolytus* have been recorded as primary parasites of Lepidoptera.

2.—Parasites of the Willow Sawfly, *Pteronidea salicis* Linn.

A number of cocoons collected by Mr. H. S. Hanson in the soil about a willow tree at Bedford in the late autumn of 1929 yielded 153 adult insects. Of these, 102 were kindly determined by Mr. R. B. Benson as *Pteronidea salicis* Linn. The remaining 51 individuals represented seven species of parasitic Hymenoptera as follows :—

♂	♀	
9	15	*Mesoleius segmentator* Holmgren (Tryphoninae).
7	8	*Mesochorus dimidiatus* Holmgren (Ophioninae).
1	3	*Holocremnus clandestinus* Holmgren (Ophioninae).
	1	*Enicospilus ramidulus* Linn. (Ophioninae).
1		*Ophion luteus* Linn. (Ophioninae).
4	1	*Microcryptus micropterus* Grav. (Cryptinae).
1		*Microcryptus nigrocinctus* Grav. (Cryptinae).

No precise observations on the parasitism were made and I am unable to say which, if any, of the species are hyperparasitic. Of the seven species only *Mesoleius segmentator* seems to have been previously reported from *Pteronidea salicis*.

References.

Paillot, A; Ferrière, C.; and Faure, J. C. 1914. Note préliminaire sur les parasites des *Apanteles* hôtes de *Pieris brassicae* L., dans la région de Lyon, en 1913. *Rev. Path. vég. et Ent. agric.*, 11 (1): 78-85.

Wadsworth, J. T. 1915. Notes on some Hymenopterous parasites bred from the pupae of *Chortophila brassicae* Bouché, and *Acidia heraclei* L. *Ann. Appl. Biol.*, **2**: 158-161.

George Salt.

A new locality for Hylaeus (= Prosopis) cornuta Smith (Hym., Hylaeidae).

A very worn female of this species was taken on *Angelica* on August 28th, 1935, at Ampthill, a district falling within the Lower Greensand belt in Bedfordshire. Curiously enough this was the only 'Aculeate' taken on this plant, although the sun was shining strongly at the time. A luxuriant growth of *Rubus* is situated in the locality, so that search made on the flowers of this plant in the early summer of next year should give information as to its abundance relative to other members of the genus.

Dr. R. C. L. Perkins, F.R.S. (who kindly confirmed my identification) informs me that this bee has been taken in the counties of Hampshire (original locality), Suffolk and Surrey, and also near to Oxford.

V. H. Chambers.

Notes on Hylaeus hyalinata Smith (Hym., Hylaeidae).

Several cells of this species were dug out of a sandbank near Woburn (Beds.) on June 30th, 1934, and placed in a tube. Two larvae, 4-5 mm. long, fell out of their cells; one larva died, and the other was presumed to have done so, although it appeared fresh. However, this larva, still lying free in the tube, pupated unexpectedly towards the end of May, 1935; the eyes darkening on June 10th, the body on June 24th. This (a male) and a female from the intact cells emerged on the 30th, a second female appearing on July 2nd.

As no food material was noticed in the cells at the time of collecting, and the larva lying in the tube appeared full-fed, taken in conjunction with the fact that the emerging dates and collecting date of the previous year were identical, it appears that this species requires at least two seasons for its development.

The cells, which resemble thin cellophane, were observed to possess a very powerful lemon-like odour after the adults had emerged.

V. H. Chambers.

Polygonia c-album L. (Lep.) in Bedfordshire.

Following on the original record for the county noted in 1934, *Ent. Mon. Mag.*, **70**: 277, individuals of this species were observed at Clophill and on the Hexton hills during July of this year; so that, as with other southern counties, this butterfly is probably to be considered of frequent occurrence in Bedfordshire. V. H. CHAMBERS.

A note on some Hymenoptera bred from a dead willow.

A dead willow tree at the Biological Field Station of the Imperial College of Science and Technology, Slough, Bucks, was examined on January 10th, 1935. The wood of the tree, which was found to be damp and comparatively soft, was chipped away by means of a pocket-knife. A number of larvae and cocoons were discovered lying in galleries in the wood. The larvae and cocoons were removed from the tree and kept with small pieces of damp wood in glass-top metal boxes.

PEMPHREDON LUGUBRIS Latr.

Seven fully-fed larvae of a brilliant orange-yellow colour were removed from the tree. Four of these pupated on January 29th-31st, 1935, and the remaining three failed to pupate. None of the adults emerged properly from the pupae, but fortunately they were not so deformed as to prevent identification. They were identified as specimens of *Pemphredon lugubris* Latr. (Sphecoidea, Pemphredonidae).

OMALUS AURATUS (Linné).

One yellow cocoon, with one of its ends somewhat enlarged and flattened, was found. The adult emerged on April 13th, 1935, and was identified as *Omalus auratus* (Linné) (Vespoidea, Chrysididae). This is a well-known parasite of *Pemphredon lugubris* Latr., and is commonly associated with this species.

COELOCRABRO AMBIGUUS (Dahlb.).
HABRITYS BREVICORNIS (Ratz.).
DEMOPHELES CALIGINOSUS (Grav.).

Thirteen greyish cocoons, covered with the remains of the prey consisting of small Homoptera on which the larvae had fed, were removed from the tree. From one cocoon three specimens of the parasite *Habritys brevicornis* (Ratz.) (Chalcididae, Miscogasterinae) emerged on April 11th, 1935. Six specimens of *Coelocrabro ambiguus* (Dahlb.) (Sphecoidea, Crabronidae)' the host species, emerged from six of the remaining twelve cocoons, one emerging on April 11th, 1935, and five on April 25th, 1935. From the other six cocoons emerged three females and three males of the rare parasite *Demopheles caliginosus*

(Grav.) (Ichneumonidae, Cryptinae). The females emerged on April 2nd, 1935, and the males on April 8th, 1935.

Habritys brevicornis (Ratz.) has been recorded by Saunt (1925) as a parasite of *Coelocrabro leucostomoides* Richards (= *leucostomus* auctt. *nec* Linn.), and also by Richards (1935) as a parasite of the same host from Hampton, Middlesex. Hallett (1927) records *Habritys brevicornis* (Ratz.) as a parasite of *Clytochrysus chrysostomus* (Lep.) from Glamorgan.

Morley (1907), in referring to *Demopheles caliginosus* (Grav.), says: 'It occurs in June throughout northern and central Europe, but I know of no specific British records, and it was not recognized as indigenous till 1872. There are three males and two females in Dr. Capron's collection, probably captured in Surrey.' In the British Museum (Natural History) there are two females of *Demopheles caliginosus* (Grav.) from Leighton Buzzard dated June 7th, 1906, bred by Crawshay (1907) from the burrows of the wood-boring Cerambycid beetle *Tetropium gabrieli* var. *crawshayi* Shp. With one of these specimens is a cocoon identified by Dr. O. W. Richards as that of a Crabronid, probably a *Solenius* sp. or *Clytochrysus* sp.

One female and one male of the *Demopheles caliginosus* (Grav.) bred at Slough have been placed in the collection at the British Museum (Natural History). The other specimens are in Dr. Richards' and my own collections.

I desire to thank Dr. O. W. Richards for his help in writing this note and for the identification of *Pemphredon lugubris* Latr.,, *Omalus auratus* (Linné), *Coelocrabro ambiguus* (Dahlb.) and *Habritys brevicornis* (Ratz.), Mr. J. F. Perkins for the identification of *Demopheles caliginosus* (Grav.) and Mr. W. H. Goddard for assistance in collecting the material.

References.

Crawshay, G. A. 1907. The life-history of *Tetropium gabrieli*, Ws. = *T. fuscum*, Sharp = *T. crawshayi*, Sharp, etc. *Trans. Ent. Soc. Lond.*, **1907**: 183-212, 6 pls.

Hallett, H. M. 1927 (1928). The Hymenoptera Aculeata of Glamorgan. *Trans. Cardiff Nat. Soc.*, **60**: 33-67.

Morley, C. 1907. The Ichneumons of Great Britain, Plymouth, **2**: 18-19.

Richards, O. W. 1935. Some breeding records of Diptera. *J. Soc. Brit. Ent.*, **1** (1): 80-1.

Saunt, J. W. 1925. Notes on the prey of *Crabro* (*Coelocrabro*) *leucostomus* L. *Ent. Mon. Mag.*, **61**: 257-8.

Edward McC. Callan.

Two examples of unusual behaviour in Bombidae (Hym.).

While collecting Bombidae at a large patch of *Digitalis purpurea* L. near Newlands Corner, Surrey, on June 30th, 1935, I observed two bees behaving in an entirely different manner from all the others.

One of these was a worker *B. pratorum,* which was visiting only the flowers from which the corollas had recently fallen. I have previously recorded (1934, *Jour. Soc. Brit. Ent.,* **1** (1): 9) workers of *B. agrorum* visiting *D. purpurea* in this manner, but this is the first time I have noted this behaviour in another species of *Bombus.*

The second example was a worker *B. lucorum* L., which was 'robbing' the flowers. The bee alighted on the top of the corolla and pierced it high up on the right hand side, about $\frac{1}{4}$ in. from the base. This worker was consistently robbing all the flowers it visited, while the others, both of *B. lucorum* and *B. terrestris* L., were visiting the flowers in the normal way.

I have frequently noted that the workers of both *B. lucorum* and *B. terrestris* more often rob the flowers of the broad-bean than not, but this is the first instance I have seen of the robbing of *D. purpurea,* though F. W. L. Sladen (1912, The Humble Bee, London: 8) notes that *B. terrestris* 'has a trick of biting holes in such flowers as broad-bean, snapdragon, and foxglove, close to the honey-glands, to abstract the honey.'

D. O. Boyd.

Bombus subterraneus L. (=latreillellus Kirb.) (Hym.) at Botley, Hants.

On July 30th, 1935, I took a female *B. subterraneus* at flowers of *Antirrhinum* sp. in a garden at Botley, Hants.

This capture seems worth recording, as H. P. Jones (1925-1926, The Hymenoptera-Aculeata of Hampshire, *Ent. Rec.,* **37-38**: Suppl. 13) only records it from the New Forest and notes that it is 'uncommon in S. Hants in my experience, although undoubtedly much overlooked.' D. O. Boyd.

Male Stylops aterrima Newport (Strepsiptera) in Surrey.

While collecting Hymenoptera at sallows at West Horsley, on 14th April, 1935, I took a female *Andrena* which appeared to be heavily 'stylopised.' A more careful examination showed that it had been parasitised by four *Stylops.* Under the fourth abdominal tergite was a female *Stylops* and an empty male pupa, and under the third tergite another empty male pupa and one which had not emerged.

From the latter I dissected out a male *Stylops* which was still alive, though seriously injured, probably by the cyanide, since it never became fully active and was killed on the following day.

Dr. O. W. Richards has kindly determined the species of this specimen as being *Stylops aterrima* Newport.

The *Andrena* was a female of *A. jacobi* Perkins.

D. O. Boyd.

Anthonomus rubi Herbst. (Col., Curculionidae) visiting flowers of Bellis perennis L.

On the 24th April, 1935, an adult *A. rubi* was found feeding on the pollen in a flower of *B. perennis* at Botley, Hants. Four more were found on the same group of flowers on the 29th April.

The association of this beetle with *B. perennis* seems worth recording, firstly because (according to my own experience) very few insects are recorded as visiting this flower; secondly, as I believe that this is the first record of *A. rubi* visiting it.

After hibernation *A. rubi* commonly feeds on the pollen of *Taraxacum Dens-leonis* Desf., before moving to its principal host plant (in this district), the cultivated strawberry.

D. O. Boyd.

List of Insects found near Aviemore, Inverness-shire, from June 20th to July 2nd, 1933.

ORTHOPTERA.

Gomphocerus maculatus Thunb.: 2.vii.33, Culbin Sandhills, Elgin.
Omocestus viridulus L.: 25.vi.33, Granish.

PLECOPTERA.

Diptyopteryx mortoni Klap.: 1.vii.33, Glen Feshie.
Taeniopteryx risi Mort.: 24.vi.33, Loch Morlich.
Amphinemura cinerea Ol.: 28.vi.33, Loch Einich.
Nemoura standfussi Ris: 24.vi.33, 28 and 29.vi.33, Lochs Morlich, Einich and Garten.
Nemoura variegata Ol.: 27.vi.33, Granish.
Leuctra handlirschi Kempny: 20.vi.33, Loch Morlich.
Leuctra nigra Pict.: 29.vi.33, Loch Garten.

PSOCOPTERA.

Mesopsocus unipunctatus Müll.: 1.vii. 34, Glen Feshie.

EPHEMEROPTERA.

Leptophlebia marginata L.: 22.vi.34, Lairig Ghru.
Ameletus inopinatus Eaton: 22.vi.34, Lairig Ghru; 21.vi.34, Granish.

ODONATA.

Sympetrum danae Sulz.: 2.vii.34, Culbin Sands, Elgin.
Pyrrhosoma nymphula Sulz.: Loch Einich, 28-30.vi.33, Loch an Eilan. This species was common and well distributed in the Aviemore neighbourhood.
Enallagma cyathigerum Charp.: Well distributed and common in the district. Very common at Granish, 21, 25 and 27.vi.33.

Lestes sponsa Hans. was emerging freely. *Coenagrion puella* L.: 1 specimen, Culbin. *Cordulegaster boltonii* Don. was often met with, and *Aeshna juncea* L. not uncommonly. One or two *Libellula quadrimaculata* L. were noted. Although several likely lochs were carefully explored in their whole circumference, *Leucorrhinia dubia* V. der Lind., *Somatochlora metallica* V. der Lind., *S. arctica* Zett., *Aeshna caerulea* Strøm and *Agrion hastulatum* Charp. were not observed. The dates of appearance of the species seem very early.

HEMIPTERA.

(Heteroptera.)

Nabis flavomarginatus Scholtz.: 30.vi.33, Glen Einich.
Salda scotica Curt.: 30.vi.33, Glen Einich; 1.vii.33, Feshie Glen.
Anthocoris nemorum L.: 29.vi.33, Loch Garten.
Megaloceraea ruficornis Fourc.: 1.vii.33, Feshie Glen.
Leptopterna ferrugata Fall.: 22.vi.33, Lairig Ghru; 1.vii.33, Feshie Glen.
Dichrooscytus rufipennis Fall.: 23.vi.33, Loch an Eilan.
Lygus contaminatus Fall.: 29.vi.33, Spey Bridge, Grantown.
Orthotylus fuscescens Kb.: 24.vi.33, Forest of Glenmore; 29.vi.33, Loch Garten.

(Homoptera.)

Deltocephalus distinguendus Flor.: 1.vii.33, Feshie Glen.
Cixius nervosus L.: 21.vi.33, Granish; 22.vi.33, Lairig Ghru; 24.vi.33, Forest of Glenmore; 26.vi.33, woods at foot of Cairngorm.
Delphax discreta Edw.: 29.vi.33, Loch Garten.
Dicranotropis ? n.sp. nr. *hamata* Boh.: 1.vii.33, Feshie Glen; 2.vii.33, Forres.

NEUROPTERA.

Hemerobius marginatus Steph.: 22.vi.33, Lairig Ghru.

TRICHOPTERA.

Phryganea varia Fab.: 30.vi.33, Glen Einich.
Mystacides azurea L.: 20.vi.33, Loch Morlich, abundant.
Cyrnus trimaculatus Curt.: 23.vi.33, Loch an Eilan.

LEPIDOPTERA.

Coenonympha tullia Müll.: 30.vi.33, Glen Einich.
Miana strigilis Clerck.: 27.vi.33, Granish.
Graphiphora rubi View.: 28.vi.33, Glen Einich.
Eupithecia nanata Hb.: 20.vi.33, Loch Morlich.
Odezia atrata L.: 22.vi.33, Lairig Ghru.

Bupalus piniarius L.: 20.vi.33, Rothiemurchus Forest. Where southern specimens show ochreous-yellowish, these specimens are quite white.
Psodos coracina Esp.: 22.vi.33, Lairig Ghru; 26.vi.33, Cairngorm.
Crambus hortuellus Hb.: 25.vi.33, Loch Alvie.
Argyroploce mygindana Schiff.: 26.vi.33, Cairngorm.
Laspeyresia aurana F.: 29.vi.33, Spey Bridge (Grantown). This species does not appear to have been recorded north of the Clyde.

COLEOPTERA.

Cicindela campestris L.: 24.vi.33, Forest of Glenmore.
Carabus catenulatus Scop.: 22.vi.33, Lairig Ghru; 26.vi.33, Cairngorm (near top); 30.vi.33, Glen Einich.
Carabus glabratus Pk.: 24.vi.33, Forest of Glenmore.
Trechus quadristriatus Sk.: 29.vi.33, Loch Garten.
Geodromicus plagiatus F.: 26.vi.33, Cairngorm.
Geodromicus globulicollis Mn.: 26.vi.33, Cairngorm.
Meligethes aeneus F.: 22.vi.33, Lairig Ghru.
Potosia cuprea F.: 29.vi.33, found by E. Rivenhall Goffe at Granish and kindly given to me by him.
Trichius fasciatus L.: 29.vi.33, found by E. Rivenhall Goffe at Granish and kindly given to me by him.
Rhagium bifasciatum F.: 21-27.vi.33, Granish.
Phyllodecta vitellinae L.: 29.vi.33, Spey Bridge (Grantown).

DIPTERA.

Sciara pulicaria Mg.: 20.vi.33, Loch Morlich; 28.vi.33, Loch Einich.
Chironomus sp.: 27.vi.33, Granish.
Chironomus olivaceus Mg.: 20.vi.33, Morlich; 21.vi.33, Granish.
Ceratopogon brachialis Hal.: 24.vi.33, Forest of Glenmore.
Ceratopogon serripes Mg.: 24.vi.33, Forest of Glenmore.
Dicranomyia pilipennis Egg.: 26.vi.33, Cairngorm.
Dicranomyia ornata Mg.: 29.vi.33, Loch Garten.
Chilotrichia imbuta Mg.: 24.vi.33, Loch Morlich.
Erioptera macrophthalma Lw.: 27.vi.33, Granish.
Lipsothrix errans Wlk.: 24.vi.33, Loch Morlich.
?*Anisomera aequalis* Lw.: 1.vii.33, Glen Feshie.
Tipula scripta Mg.: 22.vi.33, Lairig Ghru.
Tipula lateralis Mg.: 24.vi.33, Forest of Glenmore.
Haematopota crassicornis Whlbg.: 22.vi.33, Lairig Ghru.
Therioplectes montanus Mg.: 21.vi.33, Granish.
Therioplectes distinguendus Verr.: 21.vi.33, Granish; 30.vi.33, Glen Einich.
Tabanus sudeticus Zlr.: 30.vi.33, Glen Einich.
Chrysops relicta Mg.: 21.vi.33, Granish.

Symphoromyia crassicornis Pz.: 26.vi.33, Cairngorm.
Laphria flava L.: 21 & 27.vi.33, Granish.
Hybos grossipes L.: 24.vi.33, Loch Morlich; 26.vi.33, Cairngorm; 28-30.vi.33, Loch Einich; 29.vi.33, Loch Garten.
Cyrtoma nigra Mg.: 21.vi.33, Granish; 24.vi.33, Loch Morlich; 28.vi.33, Loch Einich.
Rhamphomyia sulcata Fln.: 29.vi.33, Loch Garten.
Rhamphomyia umbripennis Mg.: 22.vi.33, Lairig Ghru.
Hilara fuscipes F.: 24.vi.33, Loch Morlich; 28.vi.33, Loch Einich.
Hilara litorea Fln.: 1.vii.33, Glen Feshie.
Trichina clavipes Mg.: 24.vi.33, Loch Morlich.
Wiedemannia rhynchops Now.: 30.vi.33, Glen Einich.
Hemerodromia melanocephala Hal.: 1.vii.33, Glen Feshie.
Tachydromia nigritarsis Fln.: 28.vi.33, Loch Einich.
Tachydromia minuta Mg.: 20.vi.33, Loch Morlich; 28.vi.33, Loch Einich.
Tachydromia cothurnata Mcq.: 1.vii.33, Glen Feshie.
Tachydromia flavipes F.: 1.vii.33, Glen Feshie.
Tachydromia annulata Fln.: 27.vi.33, Granish.
Tachydromia ecalceata Ztt.: 1.vii.33, Glen Feshie.
Tachydromia flavicornis Mg.: 29.vi.33, Loch Garten.
Dolichopus atripes Mg.: 24.vi.33, Loch Morlich; 26.vi.33, Cairngorm.
Dolichopus vitripennis Mg.: 24.vi.33, Loch Morlich.
Dolichopus lepidus Staeg.: 26.vi.33, Cairngorm.
Dolichopus melanopus Mg.: 24.vi.33, Forest of Glenmore.
Dolichopus planitarsis Fln.: 22.vi.33, Lairig Ghru.
Dolichopus confusus Ztt.: 1.vii.33, Glen Feshie.
Dolichopus discifer Stan.: 24.vi.33, Forest of Glenmore; 26.vi.33, Cairngorm; 29.vi.33, Loch Garten; 1.vii.34, Glen Feshie.
Dolichopus plumipes Scop.: 1.vii.33, Glen Feshie.
Dolichopus wahlbergi Ztt.: 29.vi.33, Loch Garten.
Dolichopus pennatus Mg.: 1.vii.33, Glen Feshie.
Dolichopus signatus Mg.: 1.vii.33, Glen Feshie.
Dolichopus urbanus Mg.: 29.vi.33, Spey Bridge (Grantown).
Dolichopus acuticornis W.: 1.vii.33, Glen Feshie.
Dolichopus lineaticornis Ztt.: 1.vii.33, Glen Feshie.
Dolichopus simplex Mg.: 24.vi.33, Forest of Glenmore; 27.vi.33, Granish.
Dolichopus aeneus Deg.: 27.vi.33, Granish; 30.vi.33, Glen Einich.
Tachytrechus notatus Stan.: 22.vi.33, Lairig Ghru.
Hercostomus cretifer Walk.: 29.vi.33, Spey Bridge (Grantown).
Hercostomus nigripennis Fln.: 29.vi.33, Spey Bridge (Grantown); 30.vi.33, Glen Feshie.
Hercostomus atrovirens Lw.: 1.vii.33, Glen Feshie.
Hercostomus parvilamellatus Mcq.: 1.vii.33, Glen Feshie.

Hypophyllus sp.: 29.vi.33, Loch Garten.
Chrysotus neglectus W.: 29.vi.33, Loch Garten.
Chrysotus cilipes Mg.: 29.vi.33, Loch Garten.
Chrysotus femoratus Ztt.: 1.vii.33, Glen Feshie.
Sympycnus cirrhipes Wlk.: 1.vii.33, Glen Feshie.
Sympycnus annulipes Mg.: 27.vi.33, Granish; 29.vii.33, Loch Garten; 1.viii.33, Glen Feshie.
Sympycnus aeneicoxa Mg.: 29.vi.33, Loch Garten.
Xanthochlorus ornatus Hal.: 1.vii.33, Glen Feshie.
Xanthochlorus tenellus W.: 29.vi.33, Loch Garten.
Lonchoptera trilineata Ztt.: Loch Einich.
Chilosia antiqua Mg.: Grantown, 29.vi.33.
Platychirus peltatus Mg.: 24.vi.33, Forest of Glenmore; 1.vii.33, Glen Feshie.
Platychirus podagratus Ztt.: 22.vi.33, Lairig Ghru.
Melanostoma mellinum L.: 21.vi.33, Granish; 24.vi.33, Glenmore; a melanotic var., 29.vi.33, Loch Garten.
Melanostoma scalare F.: 26.vi.33, Glenmore.
Didea intermedia Lw.: 25.vi.33, Granish.
Syrphus annulipes Ztt.: 21.vii.33, Granish.
Syrphus vittiger Ztt.: 25.vi.33, Granish.
Sphaerophoria flavicauda Ztt. (var. *flavicauda*): 24 & 26.vi.33, Glenmore; 29.vi.33, Loch Garten.
Chamaesyrphus scaevoides Fln.: 21.vi.33, Granish.
Ascia floralis Mg.: 22.vi.33, Lairig Ghru; 27.vi.33, Granish.
Xylota abiens W.: 22.vi.33, Lairig Ghru.
Sericomyia lappona L.: 27.vi.33, Granish.
Hypochaeta inepta Mg.: 22.vi.33, Lairig Ghru; 24.vi.33, Glenmore.
Siphona cristata F.: 29.vi.33, Grantown.
Pollenia rudis F.: 22.vi.33, Aviemore.
Protocalliphora groenlandica Ztt.: 1.vii.33, Glen Feshie; 2.vii.33, Forres.
Calliphora germanorum Vill.: 29.vi.33, Granish (round dead woodcock).
Lucilia caesar L.: 22.vi.33, Lairig Ghru.
Phaonia consobrina Ztt.: 22.vi.33, Lairig Ghru; 27.vi.33, Granish.
Phaonia morio Ztt.: 22.vi.33, Lairig Ghru.
Lophosceles cristatus Ztt.: 28.vi.33, Glen Einich.
Lasiops semicinerius W.: 20.vi.33, Morlich; 22.vi.33, Lairig Ghru.
Phaonia errans Mg.: 29.vi.33, Grantown.
Phaonia vagans Fal.: 21.vi.33, Granish.
Phaonia basalis Ztt.: 22.vi.33, Lairig Ghru.
Hebecnema vespertina Fln.: 21.vi.33, Granish; 22.vi.33, Lairig Ghru; 24.vi.33, Glenmore; 28 & 30.vi.33, Glen Einich; 29.vi.33, Loch Garten.

Helina quadrimaculata Fln.: 29.vi.33, Loch Garten.
Helina fratercula Ztt.: 29.vi.33, Loch Garten; 30.vi.33, Glen Einich.
Spilogona grandis Stein: 28.vi.33, Loch Einich.
Spilogona aërea Fln.: 1.vi.33, Glen Feshie.
Spilogona denigrata Mg.: 24.vi.33, Glenmore; 1.vii.33, Glen Feshie.
Spilogona contractifrons Ztt.: 21.vi.33, Granish; 22.vi.33, Lairig Ghru; 24.vi.33, Glenmore.
Spilogona solitariana Coll.: 22.vi.33, Lairig Ghru; 24.vi.33, Glenmore; 28.vi.33, Glen Einich; 1.vii.33, Glen Feshie.
Spilogona litorea Fln.: 27.vi.33, Granish.
Spilogona triangula Fln.: 24 & 26.vi.33, Glenmore; 26.vi.33.
Macrorchis meditata Fln.: 1.vii.33, Glen Feshie.
Chelisia monilis Mg.: 21.vi.33, Granish; 24.vi.33, Glenmore.
Hydrotaea irritans Fln.: 21.vi.33, Granish; 22.vi.33, Lairig Ghru; 25.vi.33, Loch Alvie; 24 & 26.vi.33, Glenmore; 28.vi.33, Loch Einich; 29.vi.33, Loch Garten; 30.vi.33, Glen Einich.
Rhynchotrichops subrostratus Ztt.: 22.vi.33, Lairig Ghru.
Trichopticus nigritellus Ztt.: 21.vi.33; 24.vi.33, Glenmore; 28 & 30.vi.34, Glen Einich; 29.vi.33, Loch Garten.
Hylemyia variata Fln.: 26.vi.33, Glenmore; 29.vi.33, Loch Garten.
Hylemyia lasciva Ztt.: 29.vi.33, Loch Garten; 30.vi.33, Glen Einich; 1.vii.33, Glen Feshie.
Prosalpia (*Paraprosalpia*) *sepiella* Ztt.: Lairig Ghru.
Egle parva R.-D.: 22.vi.33, Lairig Ghru; 1.vii.33, Glen Feshie.
Chiastochaeta lacteipennis Schull.: 23.vi.33, Grantown.
Pegomyia versicolor Mg.: 22.vi.33, Lairig Ghru.
Fannia aërea Ztt.: 22.vi.33, Lairig Ghru; 27.vi.33, Granish; 29.vi.33, Grantown.
Fannia hirticeps Stein: 21.vi.33, Granish.
Fannia parva Stein: 24 & 26.vi.33; 29.vi.33, Loch Garten; 1.vii.33, Glen Feshie.
Caricea tigrina F.: 1.vii.33, Glen Feshie.
Coenosia sexmaculata Mg.: 24 & 26.vi.33, Glenmore; 28.vi.33, Glen Einich; 29.vi.33, Loch Garten; 1.vii.33, Glen Feshie.
Coenosia means Mg.: 2.vii.33, Culbin Sands.
Coenosia octopunctata Ztt.: 28.vi.33, Glen Einich.
Coenosia pulicaria Ztt.: 1.vii.33, Glen Feshie.
Coenosia trilineella Ztt.: 22.vi.33, Lairig Ghru.
Coenosia geniculata Fln.: 24 & 26.vi.33, Glenmore; 1.vii.33, Glen Feshie.
Orthachaeta pilosa Ztt.: 22.vi.33, Lairig Ghru.
Pselaphila loewi Beck.: 27.vi.33, Granish.
Pogonota hireus Ztt.: 25.vi.33, Granish.
Nr. *Cosmetopus* sp.: 27.vi.33, Granish.

Scatophaga suilla F.: 22.vi.33, Lairig Ghru.
Scatophaga maculipes Ztt.: 22.vi.33, Lairig Ghru.
Scatophaga stercoraria L.: 24.vi.33, Glenmore.
Scatophaga merdaria F.: 27.vi.33, Granish; 24.vi.33, Glenmore.
Scatophaga squalida Mg.: 22.vi.33, Lairig Ghru.
Scatophaga cineraria Mg.: 22.vi.33, Lairig Ghru.
Scatophaga decipiens Hal.: 24.vi.33, Glenmore.
Helomyza laevifrons Lw.: 1.vii.33, Glen Feshie.
Blepharoptera variabilis Lw.: 1.vii.33, Glen Feshie.
Blepharoptera modesta Mg.: 24.vi.33, Glenmore; 28.vi.33, Glen Einich.
Tetanocera elata F.: 25.vi.33, Granish.
Tetanocera sylvatica Mg.: 29.vi.33, Loch Garten; 1.vii.33, Glen Feshie.
Psila rufa Mg.: 1.vii.33, Glen Feshie.
Calobata stylifera Lw.: 29.vi.33, Loch Garten.
Pteropaectria frondescentiae Lw.: 1.vii.33, Glen Feshie.
Trypeta onotrophes Lw.: 29.vi.33, Grantown.
Sapromyza longipennis F.: 25.vi.33, Loch Alvie.
Sapromyza plumicornis Fln.: 29.vi.33, Grantown.
Sapromyza anisodactyla Lw.: 1.vii.33, Glen Feshie.
Opomyza germinationis L.: 29.vi.33, Grantown; 1.vii.33, Glen Feshie.
Sepsis punctum F.: 27.vi.33, Granish.
Sepsis violacea Mg.: 29.vi.33, Loch Garten.
Sepsis nigripes Mg.: 29.vi.33, Loch Garten.
Nemopoda stercorarea Dsv.: 27.vi.33, Granish.
Notiphila venusta Lw.: 27.vi.33, Granish.
Notiphila cinerea Fln.: 27.vii.33, Granish.
Notiphila annulipes Stnh.: 27.vi.33, Granish.
Philhygria picta Fln.: 29.vi.33, Loch Garten.
Scatella aestuans Hal.: 2.vii.33, Culbin Sands.
Drosophila fenestrarum Fln.: 26.vi.33, Granish.
Centor cereris Fln.: 29.vi.33, Loch Garten; 1.vii.33, Glen Feshie.
Diplotoxa curvinervis Ztt.: 1.vii.33, Glen Feshie.
Chlorops nasuta Schnk.: 1.vii.33, Glen Feshie.
Chlorops ringens Lw.: 21.vi.33, Granish; 29.vi.33, Loch Garten.
Chlorops scalaris Mg.: 26.vi.33, Glenmore.
Chlorops troglodytes Ztt.: 1.vii.33, Glen Feshie.
?*Chloropisca* sp.: 1.vii.33, Glen Feshie.
Oscinis frit L.: 27.vi.33, Granish; 28.vi.33, Glen Einich; 29.vi.33, Loch Garten; 1.vii.33, Glen Feshie.
Oscinis pusilla Mg.: 27.vi.33, Granish; 1.vii.33, Glen Feshie.
Oscinis laevigata Fln.: 1.vii.33, Glen Feshie.
Agromyza nigripes Mg.: 1.vii.33, Glen Feshie.
Ceratomyza denticornis Pz.: 1.vii.33, Glen Feshie.
Chromatomyia affinis Mg.: 29.vi.33, Grantown.
Borborus equinus Fln.: 29.vi.33, Grantown.

Limosina fontinalis Fln.: 26.vi.33, Glenmore.
?*Phora nudipalpis* Beck.: 28.vi.33, Glen Einich.
?*Phora aptina* Schin.: 26.vi.33, Glenmore.

HYMENOPTERA.

Tenthredinidae.

Tenthredo viridis L.: 1.vii.33, Glen Feshie.
Allantus arcuatus Ste.: 27.vi.33, Granish.
Allantus arcuatus Forst. (var. *nitidior* Knw.): 27.vi.33, Granish.
Dolerus sanguinicollis Klug. (var. *fumosus* Steph.): 26.vi.33, Glenmore.
Selandria morio Ste.: 1.vii.33, Glen Feshie.
Emphytus cinctus Klug.: 29.vi.33, Grantown.
Pristiphora quercus Hart.: 24.vi.33, Glenmore.
Abia sericea Ste.: 29.vi.33, Grantown.

Cynipidae.

Eucoela mandibularis Thoms.: 24.vi.33, Glenmore.

Chalcididae.

?*Eurytoma longipennis* Walk.: 1.vii.33, Glen Feshie.
?*Eurytoma apicalis* Walk.: 1.vii.33, Glen Feshie.
Metastenus concinnus Walk.: 1.vii.33, Glen Feshie.
Semiotellus clarus Walk.: 1.vii.33, Glen Feshie.
?*Torymus angelicae* Walk.: 1.vii.33, Glen Feshie.
?*Torymus flavipes* Walk.: 1.vii.33, Glen Feshie.
Pteromalus deplanatus Nees: 1.vii.33, Glen Feshie.
Omphale salicis Hal.: 29.vi.33, Grantown.
Elasmus flabellatus Fonsc.: 1.vii.33, Glen Feshie.
Eulophus pectinicornis L.: 1.vii.33, Glen Feshie.
Eulophus hedila Walk.: 1.vii.33, Glen Feshie.
Eulophus argissa Walk.: 1.vii.33, Glen Feshie.
Cirrospilus vittatus Walk.: 1.vii.33, Glen Feshie.
?*Cirrospilus pictus* Nees.: 1.vii.33, Glen Feshie.
Tetrastichus nerio Walk.: 29.vi.33, Grantown; 1.vii.33, Glen Feshie.
Tetrastichus ater Nees: 1.vii.33, Glen Feshie.

Braconidae.

Bracon ? n.sp., nr. *fraudator* Marsh.: 29.vi.33, Grantown.
Bracon obscurator Nees: 29.vi.33, Grantown.
Bracon fuscicoxis Wesm.: 29.vi.33, Grantown.
Spathius exarator L.: 1.vii.33, Glen Feshie.
Microgaster politus Marsh.: 26.vi.33, Glenmore.
Microgaster ? *politus* Marsh. (? var. with yellow legs): 26.vi.33, Glenmore.
Apanteles impurus Nees: 29.vi.33, Grantown.
Microgaster tibialis Nees: 29.vi.33, Grantown.

Apanteles bicolor Nees: 29.vi.33, Grantown.
Euphorus pallidipes Curt.: 29.vi.33, Grantown.
Dacnusa senilis Nees: 24.vi.33, Loch Morlich; 1.vii.33, Glen Feshie.
Dacnusa ovalis Marsh.: 29.vi.33, Loch Garten.
?*Rhizarcha* nr. *talaris* Hal.: 1.vii.33, Glen Feshie.
Coclenius gracilis Hal.: 29.vi.33, Loch Garten.
Chaenon anceps Curt.: 1.vii.33, Glen Feshie.
?*Chorebus* sp. nr. *lymphatus* Hal.: 29.vi.33, Loch Garten.

ICHNEUMONIDAE.

Cratichneumon sicarius Gr.: 19.vi.33 (pupa), Aviemore (emerged 7.vii.33).
Cratichneumon rubricosus Holmgr.: 27.vi.33, Granish.
Ichneumon latrator Fab.: 1.vii.33, Glen Feshie.
?*Platylabus rufus* Wesm.: 24.vi.33, Glenmore.
Platylabus pumilio Hlgr.: 26.vi.33, Glenmore.
Diadromus subsilicornis Gr.: 29.vi.33, Loch Garten.
Dicaelotus pumilus Gr.: 1.vii.33, Glen Feshie.
Dicaelotus rufilimbatus Gr.: 29.vi.33, Loch Garten.
Dicaelotus ruficoxatus Gr.: 29.vi.33, Loch Garten.
?*Dicaelotus* sp.: 29.vi.33, Loch Garten; 1.vii.33, Glen Feshie.
Coelocryptus rufinus Gr.: 28.vi.33, Glen Einich.
?*Microcryptus spinolae* Gr.: 1.vii.33, Glen Feshie.
Acanthocryptus quadrispinosus Gr.: 29.vi.33, Loch Garten.
Glyphicnemis suffolciensis Morl.: 29.vi.33, Loch Garten.
Phygadeuon speculator Gr.: 27.vi.33, Granish.
Phygadeuon procerus Gr.: 1.vii.33, Glen Feshie.
Phygadeuon brevitarsis Thms.: 29.vi.33, Loch Garten.
?*Phygadeuon fumator* Gr.: 29.vi.33, Loch Garten; 1.vii.33, Glen Feshie.
Hemiteles castaneus Tasch.: 29.vi.33, Loch Garten.
Hemiteles floricolator Gr.: 29.vi.33, Loch Garten.
Hemiteles melanogaster Thms.: 29.vi.33, Loch Garten.
Hemiteles rufocinctus Gr.: 29.vi.33, Loch Garten.
Hemiteles ridibundus Gr.: 29.vi.33, Loch Garten.
Hemiteles persector Parf.: 29.vi.33, Loch Garten.
Pezomachus spinulus Thms.: 24.vi.33, Glenmore.
Pezomachus instabilis Fst.: 1.vii.33, Glen Feshie.
Atractodes bicolor Gr.: 29.vi.33, Loch Garten; 1.vii.33, Glen Feshie.
Atractodes piceicornis Hal.: 28.vi.33, Glen Einich; 1.vii.33, Glen Feshie.
Atractodes exilis Hal.: 24.vi.33, Glenmore; 29.vi.33, Loch Garten; 1.vii.33, Glen Feshie.
Exolytus petiolaris Thms.: 29.vi.33, Loch Garten.
Ischnocerus rusticus Frc.: 22.vi.33, Lairig Ghru.
Ephialtes manifestor L.: 21 & 27.vi.33, Granish.

Ephialtes tuberculatus Frc.: 27.vi.33, Granish.
Pimpla turionellae L. (var. *examinator* F.): 28.vi.33, Glen Einich.
? Nr. *Glypta* sp.: 29.vi.33, Loch Garten.
Glypta ceratitis Gr.: 29.vi.33, Loch Garten.
Glypta vulnerator Gr. (var. with red coxae and trochanters): 1.vii.33, Glen Feshie.
Lissonota variipes Desv.: 29.vi.33, Loch Garten.
Lissonota trochanteralis Schm.: 1.vii.33, Glen Feshie.
Polyclistus flavipes Rtz.: 29.vi.33, Loch Garten.
Bassus multicolor Gr.: 29.vi.33, Loch Garten.
Zootrephus rufiventris Gr.: 28.vi.33, Glen Einich.
Promethus cognatus Hlgr.: 29.vi.33, Loch Garten.
Promethus laticarpus Thms.: 1.vii.33, Glen Feshie.
Promethus pulchellus Hlgr.: 24.vi.33, Loch Morlich; 28.vi.33, Loch Einich; 29.vi.33, Loch Garten.
Promethus dorsalis Hlgr.: 29.vi.33, Loch Garten.
Promethus festivus Fab.: 29.vi.33, Loch Garten.
? Nr. *Otoblastus* sp.: 29.vi.33, Loch Garten.
Mesoleptus testaceus Fab.: 29.vi.33, Loch Garten.
Mesoleptus cingulatus Gr.: 26.vi.33, Glenmore.
Catoglyptus antilope Gr.: 29.vi.33, Loch Garten.
Catoglyptus fuscicornis Gm.: 29.vi.33, Loch Garten (♀ with ♂ characters).
? Nr. *Perilissus* sp.: 29.vi.33, Loch Garten.
? Nr. *Perilissus* sp.: 1.vii.33, Glen Feshie.
Monoblastus longicornis Hlgr.: 29.vi.33, Loch Garten.
Plectiscus collaris Gr.: 1.vii.33, Glen Feshie.
Plectiscus canaliculatus Fst.: 29.vi.33, Loch Garten.
Plectiscus melanoceras Fst.: 28.vi.33, Glen Einich.
Limnerius rufifemur Th.: 29.vi.33, Loch Garten.
? Nr. *Pyracmon* sp.: 29.vi.33, Loch Garten.
Ecphoropsis fuscipes Hlgr.: 1.vii.33, Glen Feshie.
Nepiera concinna Hlgr.: 29.vi.33, Loch Garten.
Angitia interrupta Hlgr.: 1.vii.33, Glen Feshie.
Heteropelma calcator Wsm.: 29.vi.33, Loch Garten.
Mesochorus fulgurans Curt.: 29.vi.33, Loch Garten; 1.vii.33, Glen Feshie.
Mesochorus fuscicornis Brsh.: 1.vii.33, Glen Feshie.

Proctotrypidae.

Proctotrypes chittii Morl.: 29.vi.33, Loch Garten.
Proctotrypes buccatus Thoms.: 1.vii.33, Glen Feshie.
Belyta nullensis Cam.: 1.vii.33, Glen Feshie.
Galesus ? *cornutus* Pz.: 29.vi.33, Loch Garten.
? *Diapria* sp.: 21.vi.33, Granish.
Platygaster cyrsilus Walk.: 29.vi.33, Loch Garten; 30.vi.33, Glen Einich.

Platygaster attenuata Curt.: 30.vi.33, Glen Einich.
?Aphelopus atratus Dalm.: 29.vi.33, Loch Garten; 1.vii.33, Glen Feshie.

ACULEATA.

Formica rufa L.: 21.vi.33, Granish.
Acanthomyops fuliginosus Latr., ♀: 1.vii.33, Glen Feshie.
Pompilus nigerrimus Hpt.: 27.vii.33, Granish.
Pompilus spissus Schiödte: 27.vi.33, Granish.
Crabro (*Rhopalum*) *clavipes* L.: 29.vi.33, Grantown.
Crabro podagricus V. der Lind.: 29.vi.33, Grantown; 2.vii.33, Culbin Sands.
Crabro gonager Lep.: 1.vii.33, Glen Feshie.
Vespa rufa L., ♀: 20.vi.33, Loch Morlich.
Andrena analis Pz.: 29.vi.33, Grantown.

F. H. HAINES.

Honey-combs as a Bait for Moths.

In the past few years I have occasionally tried using honey in place of 'sugar' on posts and trees, but although I tried the two on alternate trees, and even side by side on the same tree-trunk, I found no noticeable difference in their attractiveness to moths. I had also on two or three occasions hung up a few frames of comb from which the honey had recently been extracted; these gave results which encouraged me to give them a more extended trial. So between 1 September and 18 October, 1935, I hung up on suitable nights a number of combs, usually 16, along the wire netting round my garden, which is near Chamberlayne's Bridge, about 2 miles south of Bere Regis, Dorset. I did this on twenty-nine nights, and twice I used them a few miles away.

The odour of a fresh, wet comb is remarkably strong and easily perceptible several yards to leeward. The reason for this is, no doubt, apart from the naturally powerful scent of honey, the large area of the cell walls, which by rough calculation I find to be 15 or 16 square feet in the case of a 'shallow' comb such as is in use in most apiaries, and fully 20 square feet in the case of a 'deep' comb, or say about the size of an average door!

The combs seem to lose little or none of their attractiveness after being used for a week or more, but, being in a position to do so, I used fresh combs when they became available. With an adequate stock of combs one could use them throughout the season if they were periodically freshened up by pouring warm honey over them and draining them thoroughly, so that it would not be necessary to keep bees for the purpose of using this method. But I doubt if anything so effective as honey-comb

could be found as a vehicle for the honey. Old carpet, blanket, or sacking, thoroughly soaked in honey, might be a passable substitute.

Heavy rain, of course, will wash out the honey, but a slight drizzle does little harm. It is hardly necessary to say that the combs should not be put out much before dusk or be left out until the bees bestir hemselves in the morning, and they must be kept in a 'bee-tight' place when not in use.

I find the moths rarely, unless absolutely replete with honey, drop or fly off the combs; in fact, it is generally quite difficult to entice them into a pill-box. When they have finished feeding the majority of them are usually seen clinging to the adjacent wire or vegetation. As with sugar, moths were far more numerous in the open; where the wire runs closely along a copse there were very few, from whatever quarter the wind blew. They chose the sheltered face or edge of the comb, of course.

I will now give a list of the species taken, and some notes on what seems to me to be the more interesting features of the experiment. For the 'macrolepidoptera' I have followed R. South's 'The Moths of the British Isles.' Several of the moths were, of course, merely late examples of species whose season was about over; a few, perhaps, were hardly fully into their season by 18 October.

Sarrothripa revayana Scop. A few, quite fresh, October.

Agrotis segetum Schiff. Abundant throughout period.
,, *puta* Hübn. Rather common at first. Last seen 15 Sept.
,, *tritici* Linn. A few, worn, early Sept.
,, *exclamationis* Linn. Second brood, a few; 3 Sept. to 14 Oct., all in fresh condition.
,, *ypsilon* Rott. Very common, whole period.
,, *saucia* Hübn. A few, latter part of period.

Noctua glareosa Esp. Common.
,, *castanea* Esp. Fairly frequent.
,, *c-nigrum* Linn. Common throughout period.
,, *umbrosa* Hübn. A few, worn, first few days.
,, *xanthographa* Fabr. Abundant. Last seen 2 Oct.
,, *plecta* Linn. Fairly common. Last seen 20 Sept.

Triphaena comes Hübn. Several, worn. Last seen 27 Sept.
,, *orbona* Hufn. A few, worn. Last seen 21 Sept.
,, *pronuba* Linn. Common. Last seen 28 Sept.

Barathra brassicae Linn. A few, 2nd brood. Sept.

Eumichtis protea Bkh. Several, 20 to 26 Sept., then abruptly ceased.

Cerigo matura Hufn. One, very worn, 13 Sept.

Xylophasia monoglypha Hufn. A few, early Sept.

Aporophyla lutulenta Bkh. Very common.
,, *nigra* Haw. Abundant.
Miselia oxyacanthae Linn. Two only, 12 and 17 Oct. Perhaps only just appearing.
Agriopis aprilina Linn. One only, 16 Oct. Perhaps only just appearing.
Phlogophora meticulosa Linn. Abundant throughout period.
Hydroecia micacea Esp. Two or three, worn. Early Sept.
Leucania pallens Linn. Common.
,, *albipuncta* Fabr. Four, worn. Sept.
Stilbia anomala Haw. Several. Last seen 20 Sept.
Caradrina ambigua Fabr. Rather common. Last seen 21 Sept.
,, *quadripunctata* Fabr. Fairly common. From 20 Sept. to 14 Oct.
Amphipyra tragopogonis Linn. Common. Last seen 27 Sept.
Omphaloscelis lunosa Haw. Common. Last seen 29 Sept.
Amathes lota Clerck. Common.
,, *macilenta* Hübn. Common.
,, *circellaris* Hufn. Rather common.
,, *helvola* Linn. Fairly common.
,, *lychnidis* Ramb. Common.
Xanthia lutea Strøm. Fairly common.
,, *fulvago* Linn. Rather common.
Orrhodia vaccinii Linn. Very common.
,, *ligula* Esp. Fairly common.
Eupsilia satellitia Linn. Fairly common. Less so than expected.
Lithophane semibrunnea Haw. Two.
,, *socia* Rott. Several.
Calocampa vetusta Hübn. Five.
Rivula sericealis Scop. Several, Sept.
Plusia chrysitis Linn. A few.
,, *festucae* Linn. Seven.
,, *gamma* Linn. In numbers every night.
Abrostola triplasia Linn. One.
,, *tripartita* Hufn. A few.
Hypena rostralis Linn. One.
Hypenodes costaestrigalis Steph. Several.
Lygris testata Linn. A few.
Cidaria truncata Hufn. and/or ,, *immanata* Haw. } Fairly common. The two spp. not identified.
,, *siterata* Hufn. Fairly common.
Thera obeliscata Hübn. A few.
Oporabia dilutata Bkh. Two or three, Oct.
Xanthorhoë fluctuata Linn. Two or three.

Camptogramma bilineata Linn. Two or three.
Gymnoscelis pumilata Hübn. One.
Percnoptilota fluviata Hübn. One, 22 Sept.
Opisthograptis luteolata Linn. A few.
Epione apiciaria Schiff. A few.
Salebria fusca Haw. One.
Alispa angustella Hübn. One.
Crambus spp. Fairly numerous early in period.
Phlyctaenia ferrugalis Hübn. Several.
Nomophila noctuella Schiff. Common.
Scoparia sp. Unidentified. Several in later part of period.
Mesographe forficalis Linn. A few.
Pterophoridae. In considerable numbers. Species not identified (mainly *Pterophorus lithodactylus* Treits.).
Depressaria spp. Fairly numerous. Several spp.
Gracilaria elongella Linn.
,, *tringipennella* Zell. One.
Plutella maculipennis Curt. Common.

From this list it is evident that honey attracts not only most or all of the species that one would expect at 'sugar,' but several of genera that are rarely or never captured in that way, the outstanding examples being *Plusia* and *Abrostola*. Some moths which, in the seven years I have worked this locality, I have found notably scarce or have not taken at all have turned out to be quite common. For instance, I had only once taken *P. festucae* at light. *N. glareosa* I took in 1934 for the first time, a few only; on a good night there would be two or three dozen on the combs. *A. lutulenta* I rarely took until 1934, and in that year it was only fairly common; 6 or 7 on a comb was not uncommon. *A. nigra* I had scarcely taken here, but I have seen up to 12 on a single comb. *L. albipuncta* was new to me, but it may have been an exceptional season for it. *S. anomala* I had taken rather occasionally at light, never at sugar. *C. ambigua* and *C. quadripunctata* were previously represented in my collection by single examples. *C. vetusta* I had never taken here.

To turn to the few species that might reasonably have been expected, but which did not put in an appearance, notable absentees were *Graptolitha ornithopus* Rott., *Scoliopteryx libatrix* Linn., *Noctua rubi* View. (2nd brood), and *Catocala nupta* Linn. The first three I should certainly have expected in numbers, all being common insects here. *Catocala nupta* I almost believe does not like honey. When a test was made one night of honey versus sugar, in parallel lines a few yards apart, it was found that of the very few moths that came to the sugar one was

nupta. This moth is far from common here, but during the period under review I took several on the walls of my bungalow; not one came to the combs. The Tortricidae were quite unrepresented.

There is one very puzzling question to which I am totally unable to suggest an answer. Why, on the numerous occasions on which I have flashed a light about the entrances to my hives, have I never seen any moths trying to enter the hives? After a really good day's nectar-gathering, when the bees are expelling the hot honey-scented air from the hives with force enough to blow out a candle, and when the aroma of honey is very distinct twenty yards away, it is surely remarkable that moths are not attracted in numbers, while sugar-patches a few feet behind the hives are being well patronised.

A full season's trial is needed before the possibilities of this method can be gauged. It seems probable that it will turn out to be a means of capturing many of the things that are usually taken only at flowers, and that it will be a rich source of Geometrids and 'micros.'

To the Dipterist it may be of interest to note that species of *Tipula, Culex* and *Anopheles* of both sexes came freely to the combs, sometimes in dozens. This is, according to my experience, quite unusual with sugar.

H. L. Andrewes.

Vanessa cardui (Linn.) (Lep.) in January.

A male *Vanessa cardui* (Linn.) captured at St. Marys, Scillies, at 3 p.m., 17th January, 1936, and subsequently kept under natural conditions in an outdoor insectary at Rothamsted Experimental Station, Harpenden, became moribund on 24th January when snowing and died on 29th January.

T. Dannreuther.

Paradichlorbenzene and Celluloid.

Those who use paradichlorbenzene for the disinfection of their boxes and cabinets should be careful with specimens mounted on celluloid. I find in several boxes where 'PDB' has been used the stages of celluloid on which the insects are gummed have become coated with a dull film, probably of volatilized 'PDB.' No doubt these will clean up all right, but it is a nuisance if this clouding occurs in every box into which both 'PDB' and celluloid-mounted insects are placed.

It may be added that 'PDB' is a much better insecticide than naphthalene and is rather more pleasant to use, but it suffers from the disadvantages of being more costly and much more volatile.

W. D. Hincks.

Notes on larvae and pupae of Polygonia c-album Linn. (Lep.).

The following notes embody observations by Lt.-Col. H. D. Peile communicated to me.

A number of larvae were found on hop on 31st August, 1935 : they were nearly all at rest during the day and fed mostly at night. It was particularly noticed that they all assumed at rest a spiral attitude, the angle where the larva was raised to one side away from its support being about where the white posterior portion joins the brown anterior part, and the fore part and the head being curved round to the opposite side so that the line of continuation of the larva appeared as if broken up. The pupa also showed breaking up of the ground colour by patches of purplish-black and brown at angles to one another on both sides, aided by spots of gold and the various projections. None of the twenty-five larvae yielded parasites.

The chief point of interest in these notes appears to me to be that this larva is procryptic and feeds at night. The black and pale-spotted larvae of *Aglais urticae* Linn. and *Nymphalis io* Linn. have the habit, common in conspicuous larvae, of feeding in companies and do not restrain their movements until after dark. G. D. Hale Carpenter.

How does Ectobius (Orth.) pass the Winter?

W. J. Lucas in 1920 (' A Monograph of the British Orthoptera,' Lond.: 80) doubts how the British species of *Ectobius* pass the winter : he thinks most likely as imagines. I incline to the opinion, from data furnished by material and experience, that it is as nymphs. I think, too, that in favourable summers there are two broods in the season. In Dorset, *E. panzeri* Steph. was very common on the coast and on the heaths, chiefly in August. No doubt minute and very young nymphs, found in June and earlier, would mature about then. But very late nymphs are to be found, and I have females, carrying oöthecae, dated in July and as late as September. I have taken nymphs of *E. lividus* F. (=*perspicillaris* erron.) in May and June, doubtless to mature in June, July and August. In all these months I have seen females with oöthecae. Yet I have also found the nymph in September. This species, like the last, was common on the Dorset heaths and coast. The three species occur in the New Forest neighbourhood. *E. lapponicus* Linn. is very common on the rough ground at Appleslade. In the late hot summers it has been most abundant in June, appearing earlier, and continuing in gradually decreasing plenty until September. F. J. Killington in 1927 (' List of the Orthoptera of Hampshire and the Isle of Wight,' *Ent. Rec.*, **39**: Suppl. 3) gives proof of this species wintering as a nymph. F. H. Haines.

CONTENTS—CONTINUED.

PAGE

EUSTACE, E. M.: *Deilephila galii* Rott. (Lep., Sphingidae) in Berks 119

FRASER, F. C., Lt.-Col., M.D., F.R.E.S.: Note on *Aeshna cyanea* (Müll.) (Odonata) 116

———— *Anax imperator* Leach copulating with *Cordulegaster boltonii* (Don.) (Odonata) 117

———— Immigration of *Aeshna mixta* Latr. (Odonata) in 1935 117

———— *Chrysopa dorsalis* Burm. (Neuropt.) in Hants 118

HAINES, F. H., M.R.C.S., L.R.C.P., D.P.H.: List of Insects found near Aviemore, Inverness-shire, from June 20th to July 2nd, 1933 131

———— How does *Ectobius* (Orth.) pass the Winter? 146

HINCKS, W. D., M.P.S., F.R.E.S.: Paradichlorbenzene and Celluloid 145

KERRICH, G. J., M.A., F.L.S., F.R.E.S.: Systematic Note on Two Species of *Collyria* Schiødte (Hym., Ichneumonidae) 124

KILLINGTON, F. J., B.Sc., A.L.S., F.R.E.S.: Further records of Coccidae (Hemipt.) from Hants 119

KIMMINS, D. E.: Synonymic notes on the genera *Chloroperla, Isopteryx* and *Isoperla* (Plecoptera), with a list of the British species of *Chloroperla* 121

SALT, G., Ph.D., D.Sc., F.R.E.S.: Miscellaneous Records of Parasitism.—II 125

STAINER, J.: Odonata on the Elan-Ystwyth Pass (Cardiganshire) 118

Communications for the *Journal* should be sent to the Editor at:—

9 Bullar Road, Bitterne Park, Southampton.

SOCIETY FOR BRITISH ENTOMOLOGY

List of Publications for Sale at the Nett Prices shewn.

(All prices are post free.)

SYSTEMATIC WORKS.

British Hemiptera-Heteroptera. By H. P. Jones, 1930. 88 pp., 2 Pls. 4*s.* 6*d.*

British Neuroptera. By E. J. Killington, 1929. 36 pp., 6 Pls., 6 Figs. 4*s.* 0*d.* With Supplement (*Hemerobius*), 1934, 5*s.* 6*d.*

British Tabanidae (Dipt.). By E. R. Goffe, 1930. 71 pp., 2 Pls. 5*s.* 0*d.*

British Tipulinae (Dipt.). By H. L. F. Audcent, 1932. 35 pp., 3 Pls. 4*s.* 0*d.*

Keys to British Asilidae (Dipt.). By B. M. Hobby, 1932. 6 pp. 1*s.* 9*d.*

Meigen's 'Nouv. Class.' 1800. By E. R. Goffe, 1932. 7 pp. 1*s.* 0*d.*

British Liriopeidae (Dipt.). By H. L. F. Audcent, 1934. 12 pp., 4 Pls. 1*s.* 9*d.*

British Mecoptera (Synopsis and Feeding Habits). By B. M. Hobby and F. J. Killington, 1934. 11 pp., 2 Pls. 1*s.* 6*d.*

FAUNAL LISTS.

Tortrices of Hants and I.O.W. By W. Fassnidge, 1929. 20 pp. 1*s.* 6*d.*

Macro-Lepidoptera of Hants and I.O.W. By W. Fassnidge, 1925. 42 pp. 1*s.* 6*d.*

Hymenoptera Aculeata of Hants and I.O.W. By H. P. Jones, 1926. 13 pp. 1*s.* 0*d.* With Supplement, 1932, 1*s.* 6*d.*

Paraneuroptera of Hants and I.O.W. By F. J. Killington, 1926. 9 pp. 1*s.* 0*d.*

List of British Collembola. By F. A. Turk, 1933. 6 pp. 1*s.* 0*d.*

List of Dorset Lepidoptera. By W. P. Curtis. Introduction and Part I, 1934. 102 pp. 7*s.* 6*d.*

Other Faunal Lists no longer available as separates will be found in the Transactions and Journal.

GENERAL WORKS.

'Entomology and Ethics.' By W. Fassnidge (Presidential Address, 1931), 1932. 16 pp. 1*s.* 0*d.*

Bibliography of Entom. Notes in Publications of British Local Societies. (An indispensable Supplement to the Zoological Record.)
Part I, 1933. 24 pp. 2*s.* 6*d.*
Part II, 1934. 18 pp. 2*s.* 6*d.*

SERIAL PUBLICATIONS.

ENT. SOC. S. ENGL.

THE JOURNAL.

Parts I–IV, 1932–33 (in all 112 pp., 1 Pl.). 2*s.* 6*d.* each.

THE TRANSACTIONS.

No. IV,	1928	4*s.* 0*d.*
No. V,	1929	7*s.* 6*d.*
No. VI,	1930	*out of print.*
Vol. VII,	Part 1, 1931 ...	7*s.* 0*d.*
Vol. VII,	Part 2, 1932 ...	10*s.* 6*d.*
Vol. VIII,	Part 1, 1932 ...	8*s.* 0*d.*
Vol. VIII,	Part 2, 1933 ...	7*s.* 0*d.*

Transactions Nos. 1—3 were issued by the Hampshire Entomological Society and are out of print. Copies, however, are sometimes available, and particulars of any on hand may be had on request.

SOC. BRIT. ENT.

THE JOURNAL.

Vol. I, Part 1, May, 1934	...	2*s.* 6*d.*
Vol. I, Part 2, Oct., 1934	...	2*s.* 6*d.*
Vol. I, Part 3, April, 1935	...	2*s.* 6*d.*

THE TRANSACTIONS.

Vol. I, Part 1, June, 1934. 102 pp., 9 Pls. 10*s.* 6*d.*

Vol. I, Part 2, Nov., 1934. 184 pp., 10 Pls. 12*s.* 0*d.*

The list of Contents of any Volume will be sent on request.

The Subscription to the Society, which includes copies of all matter published during the period covered, is 21*s.* 0*d.* per annum. There is no entry fee.

Orders, accompanied by the appropriate remittance, should be addressed to **E. Rivenhall Goffe,** Hon. Sec., 102, High Street, **Southampton.**

595.7
.S66

VOL. 1. PART 6.

JOURNAL

OF THE

SOCIETY FOR BRITISH ENTOMOLOGY

EDITOR:

F. J. KILLINGTON, B.Sc., A.L.S., F.R.E.S.

ASSISTANT EDITOR:

B. M. HOBBY, M.A., D.PHIL., F.R.E.S.

SMITHSONIAN INSTITUTION
AUG 2 3 1936
NATIONAL MUSEUM

DATE OF PUBLICATION: 14TH AUGUST, 1936.

Copies may be purchased from the Secretary at 102, High Street, Southampton.

Price 2s. 6d., post free.

CONTENTS.

PAGE

ANDREWES, H. L., F.R.E.S.: Early records of *Vanessa atalanta* L. (Lep.) 162

CARPENTER, J. R., M.A., and FORD, J., B.A.: The use of sweep net samples in an Ecological Survey 155

CURTIS, W. P., F.R.E.S.: *Eupithecia distinctaria* Herr.-Schäff. (Lep.) 166

———— *Syzeuctus maculatorius* F. (Hym., Ichneumonidae) bred from *Epischnia bankesiella* Rich. (Lep., Phycitidae) 168

GODDARD, W. H.: A Further Record of the Hemiptera Heteroptera collected at the Imperial College Biological Field Station, Slough, Bucks 165

HAINES, F. H., M.R.C.S., L.R.C.P., D.P.H.: List of Insects found near Aviemore, Inverness-shire, from June 20th to July 2nd, 1933 162

HINCKS, W. D., M.P.S., F.R.E.S.: Chironomidae (Diptera) from Grisedale Tarn, Westmorland ... 151

KIMMINS, D. E.: British Ephemeroptera, Plecoptera and Trichoptera in 1935 147

MORTON, K. J., F.R.E.S.: Scottish Chrysopidae (Neuropt.) in 1935 154

NICHOLSON, C.: *Araujia sericifera* Brot. and its Insect Visitors 164

PITMAN, C. M. R.: Wild pairing of *Taeniocampa gothica* Linn. with *T. stabilis* View. (Lep.) 169

———— *Sphinx convolvuli* L. (Lep.) in Wiltshire, 1935 170

———— Attacks of birds on insects 170

RICHARDS, O. W., M.A., D.Sc., F.R.E.S.: Breeding records of Hymenoptera and Diptera 162

TATHAM, C. J.: *Lycaenopsis argiolus* (Linn.) (Lep.) in Leicestershire in 1936 153

Communications for the *Journal* should be sent to the Editor at:—

9, Bullar Road, Bitterne Park, Southampton.

JOURNAL OF THE SOCIETY FOR BRITISH ENTOMOLOGY

VOL. I. 14TH AUGUST, 1936. PART 6.

British Ephemeroptera, Plecoptera and Trichoptera in 1935.

The following list is based on material sent to Mr. M. E. Mosely or myself for determination at the British Museum, and much of it has been presented to the Museum collections. Additional records of the distribution of these insects are always valuable, as there are comparatively few collectors interested in these groups.

The initials in brackets following the dates represent collectors' names, as follows:—W.E.C., Mr. W. E. China; L.W.G., Rev. Prof. L. W. Grensted; A.D.G., Master A. D. Grensted; D.E.K., Mr. D. E. Kimmins; M.E.M., Mr. M. E. Mosely; and A.R.W., Mr. A. R. Waterston, of the Edinburgh University Biological Expedition.

Specimens are recorded from the following localities:—ARGYLL: Portsonachan. BERKSHIRE: Hinksey, Pangbourne. CHESHIRE: Redesmere, Stalybridge. CUMBERLAND: Borrowdale, Buttermere, Caldbeck, Derwentwater, Ennerdale Water, Keswick, Threlkeld, Uldale, Watendlath, Watermillock. DERBYSHIRE: Glossop, Taddington. DEVONSHIRE: Brendon Common, Lee Abbey, Lynton. HERTFORDSHIRE: Hitchin. LANCASHIRE: Garstang. NORTHAMPTONSHIRE: Desborough. OXFORDSHIRE: Bletchingdon, Cassington, Headington, Iffley Lock, Shipton-on-Cherwell. PERTHSHIRE: St. Fillans. SOMERSETSHIRE: Bicknoller, Bridgwater, Kilve, Lee Abbey, Oare, Porlock, Washford, Williton. STAFFORDSHIRE: Tong, nr. Wolverhampton. SURREY: Abinger, Burford Bridge, Dorking, Friday Street, Milton Street, Westcott. SUSSEX: Hartfield. WARWICKSHIRE: Stonebridge. WESTMORLAND: Kendal, Milnthorpe. OUTER HEBRIDES: Barra.

EPHEMEROPTERA.

EPHEMERIDAE.

Ephemera vulgata L.—Friday Street, 28.v. (D.E.K.).

E. danica Müll.—Headington, 26.v. (L.W.G.). Friday Street and R. Mole, Burford Bridge, 28.v. (W.E.C., D.E.K.).

LEPTOPHLEBIIDAE.

Leptophlebia marginata (L.).—Glossop, 4.v.; Oxford, 11.v. (L.W.G.). St. Fillans, 6-18.vi.; Portsonachan, 21.vi. (M.E.M.).

AUG 24 1936

L. vespertina (L.).—St. Fillans, 6-18.vi. ; Portsonachan, 21.vi. (M.E.M.).

Paraleptophlebia submarginata (Steph.).—R. Medway, Hartfield, 5.v. (D.E.K.). Friday Street, 28.v. (W.E.C., D.E.K.).

CAENIDAE.

Caenis horaria (L.).—Barra, vii. (A.R.W.).

BAËTIDAE.

Baëtis pumilus (Burm.). — Kilve, 19.viii. (A.D.G.). Threlkeld, 3.ix. ; Ulleswater, Watermillock, 6.ix. (L.W.G.).

B. scambus Etn.—Buttermere, 27.viii. (L.W.G.).

B. rhodani (Pict.). — Glossop, 4.v. (L.W.G.). Barra, vii. (A.R.W.).

B. bioculatus (L.).—Kendal, 6.ix. (L.W.G.).

B. tenax Etn.—Stonebridge, 5.v. (L.W.G.).

Centroptilum luteolum (Müll.).—Oxford, R. Cherwell, 12.v. (L.W.G.). Portsonachan, 21.vi. (M.E.M.). Derwentwater, 27.viii. ; Keswick, 28.viii. (L.W.G.).

Cloëon dipterum (L.).—Oxford, R. Cherwell, 12.v. (L.W.G.). Milton Street, 28.v. (D.E.K.).

C. simile Etn.—Barra, vii. (A.R.W.).

ECDYONURIDAE.

Heptagenia sulphurea (Müll.).—Abinger, R. Tillingbourne, 9.vi. (D.E.K.).

Ecdyonurus lateralis (Curt.).—Portsonachan, 21.vi. (M.E.M.). Porlock, 16.viii. (A.D.G.).

E. longicauda (Steph.).—Keswick, 30.viii. (L.W.G.).

E. venosus (Fabr.). — Milton Street, 28.v. (W.E.C.). St. Fillans, 6-18.vi. ; Portsonachan, 21.vi. (M.E.M.).

Rhithrogena semicolorata (Curt.). — Portsonachan, 21.vi. (M.E.M.). Lynton, 19.vii. ; Caldbeck, 26.viii. (L.W.G.).

PLECOPTERA.

PERLODIDAE.

Dictyopterygella recta (Kempny). — St. Fillans, 6-18.vi. (M.E.M.).

PERLIDAE.

Chloroperla (*Isopteryx*) *torrentium* (Pict.). — Milton Street, 28.v. (W.E.C.). St. Fillans, 6-18.vi. (M.E.M.). Oare, 16.viii. (L.W.G.). Barra, vii. (A.R.W.).

LEUCTRIDAE.

Leuctra geniculata Steph. — Washford, 20.viii. (A.D.G.). Garstang and Milnthorpe, 24.viii. (L.W.G.). Taddington, 2.ix. (A.D.G.).

L. fusciventris Steph. — Porlock, 10.viii. ; Oare, 16.viii. ; Brendon Common, 16.viii. ; Garstang, 24.viii. ; Butter-

mere, 27.viii. ; Caldbeck, 26.viii. ; Derwentwater, 27.viii. ; Watendlath, 28.viii. ; Threlkeld, 3.ix. (L.W.G.). Barra, vii. (A.R.W.).

L. hippopus Kempny.—St. Fillans, 6-18.vi. (M.E.M.).

NEMOURIDAE.

Amphinemura cinerea (Ol.).—St. Fillans, 6-18.vi. (M.E.M.).

Nemoura variegata (Ol.).—Stonebridge, 5.v. (L.W.G.).

N. cambrica Mort.—Friday Street, 9.vi. (D.E.K.).

Nemurella inconspicua (Pict.). — Brendon Common, 16.viii. (A.D.G.).

TRICHOPTERA.

PHRYGANEIDAE.

Phryganea striata L.—Friday Street, 9.vi. (D.E.K.).

P. varia Fabr.—Watendlath, 28.viii. (L.W.G.).

LIMNOPHILIDAE.

Colpotaulius incisus (Curt.).—Cassington, 9.ix. (A.D.G.).

Limnophilus marmoratus Curt.—St. Fillans, 9.vi. (M.E.M.).

L. lunatus Curt.—Cassington, 9.ix. (A.D.G.).

L. politus McL.—R. Thames, Iffley Lock, 7.x. (L.W.G.).

L. centralis Curt.—Brendon Common, 16.viii. (A.D.G.). St. Fillans, 9.vi. (M.E.M.).

L. auricula Curt.—St. Fillans, 9.vi. (M.E.M.).

L. luridus Curt.—St. Fillans, 9.vi. (M.E.M.).

L. sparsus Curt.—St. Fillans, 9.vi. (M.E.M.).

Anabolia nervosa Curt.—Cassington, 9.ix. ; Shipton-on-Cherwell, 2.xi. (A.D.G.). Desborough, 28.ix. ; Oxford, 7.x. (L.W.G.).

Stenophylax latipennis (Curt.).—Kilve, 19.viii. (L.W.G.).

SERICOSTOMATIDAE.

Sericostoma personatum (Spence).—Abinger, 9.vi. (D.E.K.).

Silo pallipes (Fabr.).—Friday Street, 28.v. (W.E.C.).

S. nigricornis (Pict.).—Pangbourne, 17.v. (L.W.G.).

Brachycentrus subnubilus Curt.—R. Teify, Lampeter, 30.iii. (Wyndham Forbes).

Crunoecia irrorata (Curt.).—Bicknoller, 18.viii. (L.W.G.).

Lepidostoma hirtum (Fabr.).—St. Fillans, 9.vi. (M.E.M.).

MOLANNIDAE.

Beraea pullata Curt.—Lee Abbey, 13.vii. (L.W.G.).

B. maurus Curt.—Hinksey, 19.vi.34 (A.D.G.).

Beraeodes minuta (L.). — Milton Street and Friday Street, 28.v. (W.E.C., D.E.K.).

ODONTOCERIDAE.

Odontocerum albicorne (Scop.). — Bicknoller, 8, 10.viii. ; Washford, 19.viii. ; Kilve, 19.viii. (A.D.G.). Oare, 16.viii. (L.W.G.).

LEPTOCERIDAE.

Leptocerus alboguttatus Hag.—Threlkeld, 3.ix. (L.W.G.).
L. aterrimus Steph.—Milton Street, 9.vi. (W.E.C.). Tong, 23.viii. (A.D.G.).
L. cinereus Curt.—Oxford, 11.ix. (A.D.G.).
L. albifrons (L.).—Williton, 14.viii. (L.W.G.). Washford, 19.viii. (A.D.G.). R. Derwent, Keswick, 26.viii. (L.W.G.).
L. bilineatus (L.).—Portsonachan, 23.vi. (M.E.M.). Dunster, 10.viii. (L.W.G.).
Mystacides nigra (L.).—Bletchingdon, 9.vi. (L.W.G.).
M. azurea (L.).—Portsonachan, 23.vi. (M.E.M.). Milnthorpe, 24.viii.; R. Derwent, Keswick, 26.viii. (L.W.G.).
M. azurea var. *albicornis* Mosely.—R. Derwent, Keswick, 26.viii. (L.W.G.).
Mystacides longicornis (L.).—Redesmere, nr. Chelford, 26.viii, 1.ix. (A.D.G.).

HYDROPSYCHIDAE.

Hydropsyche fulvipes (Curt.).—Bicknoller, 8.viii. (L.W.G.).
H. instabilis (Curt.).—Lee Abbey, 13.vii.; Bicknoller, 8.viii.; Porlock, 10.viii. (L.W.G.).
H. angustipennis (Curt.).—Tong, 23.viii.; Redesmere, 1.ix.; Stalybridge, 6.ix. (A.D.G.). Uldale, 31.viii. (L.W.G.).
Diplectrona felix McL.—Bicknoller, 18.viii. (A.D.G.). Borrowdale, 28.viii. (L.W.G.).

PHILOPOTAMIDAE.

Philopotamus montanus (Don.).—Bicknoller, 10.viii. (A.D.G.).
Wormaldia occipitalis (Pict.).—Lee Abbey, 16.vii. (L.W.G.).
W. mediana McL.—Bicknoller, 18.viii. (A.D.G.).
W. subnigra McL.—Taddington, 2.ix. (A.D.G.).

POLYCENTROPIDAE.

Neureclipsis bimaculata (L.).—Bletchingdon, 9.vi. (L.W.G.). Redesmere, 26.viii. (A.D.G.).
Polycentropus flavomaculatus (Pict.).—Bletchingdon, 9.vi. (L.W.G.). St. Fillans, 9.vi.; Portsonachan, 23.vi. (M.E.M.). Porlock, 10.viii.; Dunster, 10.viii.; Williton, 14.viii. (L.W.G.). Oare, 16.viii.; Kilve, 19.viii.; Bridgwater, 22.viii. (A.D.G.). Milnthorpe, 24.viii.; R. Derwent, Keswick, 26.viii.; Caldbeck, 26.viii.; Kendal, 6.ix. (L.W.G.). Taddington, 2.ix. (A.D.G.).
Holocentropus dubius (Steph.).—Westcott, 18.vi. (W.E.C.).
H. picicornis (Steph.).—Tong, 23.viii. (A.D.G.).
Cyrnus trimaculatus (Curt.).—Headington, 26.v. (L.W.G.). R. Mole, Dorking, 28.v. (W.E.C.). Portsonachan, 23.vi. (M.E.M.). Garstang, 24.viii.; Ennerdale Water, 4.ix. (L.W.G.). Oxford, 11.ix. (A.D.G.).

PSYCHOMYIIDAE.

Tinodes waeneri (L.).—Headington, 26.v. (L.W.G.). Friday Street, 28.v. (W.E.C., D.E.K.). Ennerdale Water, 2.ix.; Cambridge, 26.ix. (L.W.G.).

Tinodes assimilis McL. — Friday Street, 28.v. (W.E.C., D.E.K.).

Lype phaeopa (Steph.).—Headington, 26.v. (L.W.G.). Friday Street, 28.v. (W.E.C., D.E.K.). Portsonachan, 23.vi. (M.E.M.). Williton, 14.viii.; Garstang, 24.viii.; Cambridge, 27.ix. (L.W.G.). Oare, 16.viii.; Oxford, 11.ix. (A.D.G.).

Psychomyia pusilla (Fabr.).—Portsonachan, 23.vi. (M.E.M.). Williton, 14.viii. (L.W.G.).

RHYACOPHILIDAE.

Rhyacophila dorsalis (Curt.).—Friday Street, 28.v. (W.E.C.). Kilve, 19.viii.; Taddington, 2.ix. (A.D.G.). Garstang, 24.viii.; Uldale, 31.viii. (L.W.G.).

R. obliterata McL.—Caldbeck, 26.viii. (L.W.G.).

R. munda McL.—Threlkeld, 29.viii. (L.W.G.).

Agapetus fuscipes Curt.—Pangbourne, 17.v. (L.W.G.). Milton Street, 28.v. (W.E.C., D.E.K.). Lee Abbey, 13.vii.; Bicknoller, 17.viii.; Borrowdale, 28.viii.; R. Derwent, Keswick, 3.ix.; Kendal, 6.ix. (L.W.G.). Brendon Common, 16.viii.; Hitchin, 18.ix. (A.D.G.). St. Fillans, 9.vi. (M.E.M.).

A. delicatulus Mch.—Porlock, 17.vii. (L.W.G.).

HYDROPTILIDAE.

Hydroptila femoralis Etn.—Portsonachan, 23.vi. (M.E.M.).

H. occulta Etn.—Portsonachan, 23.vi. (M.E.M.).

H. maclachlani Klap.—Kilve, 12.viii. (A.D.G.); Williton, 14.viii. (L.W.G.).

Oxyethira costalis (Curt.).—Portsonachan, 23.vi. (M.E.M.).

D. E. KIMMINS
(*Dept. of Entomology, British Museum, Nat. Hist.*).

Chironomidae (Diptera) from Grisedale Tarn, Westmorland.

Grisedale Tarn, which I visited on 2nd July, 1935, is situated at the head of Tongue Gill at an altitude of 1,768 ft. and is surrounded on three sides by lofty hills. To the north rise the steep slopes of Dollywaggon Pike (2,810 ft.); Seat Sandal (2,415 ft.) is to the west and Fairfield (2,863 ft.) shelters the tarn from the east. Between Dollywaggon and Fairfield descends the Grisedale Beck, which flows through the valley of the same name to Ullswater. A spot near the source of the beck, only a few yards from the tarn, is famous as the place where Wordsworth

parted from his brother for the last time, the tragic death of the latter preventing their reunion.

On the day of my visit the weather had deteriorated by the time the tarn was reached. A strong south-west wind had sprung up and it had become quite cold. The only shelter was a low outcrop of rock at the north-east corner of the tarn, and here on the sheltered side Chironomidae abounded, at rest on the bare rock and in the grass.

A few minutes' collecting filled what available tubes I had, but unfortunately it was afterwards found that a number of the specimens had suffered owing to 'sweating.'

In the following list of eight species the nomenclature of Dr. F. W. Edwards is used (1929, *Trans. Ent. Soc. Lond.*, **77**: 279-430).

TANYPODINAE.

1. *Pentaneura monilis* (L.). Several males and females. All rather dark.

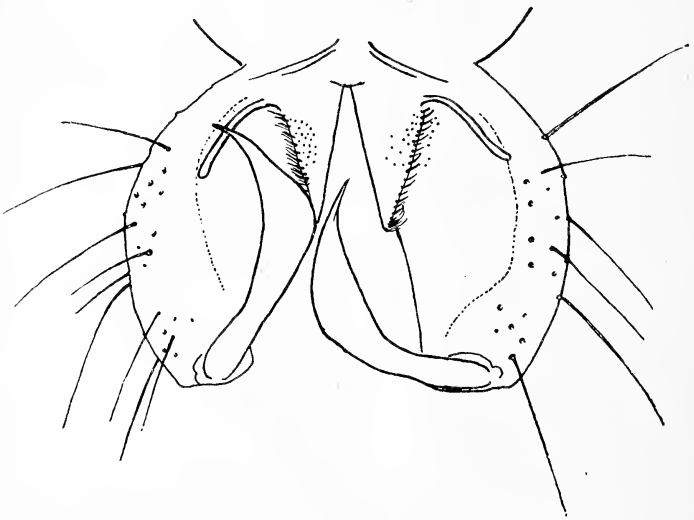


FIG. 10.—Hypopygium of *Pentaneura barbitarsis* (Ztt.).

2. *Pentaneura barbitarsis* (Ztt.). This usually uncommon species was the most abundant at the tarn. Dr. Edwards has been kind enough to confirm my determination. The insects were easily determined from Edwards' tables, but on turning to M. Goetghebuer (1927, Faune de France, **15**: 60) for a more extended description for comparison it was found that his remarks on the hypopygium did not agree with the rather striking and unusual form in my specimens. Goet-

ghebuer says, 'Pince à article basal sans lobule interne.' yet it seems impossible that he should have failed to notice the prominent lobe which is evident in my specimens. Dr. Edwards tells me that he has no reason to doubt the identity of his examples with Zetterstedt's species and that the pair I sent him also agree.

As the hypopygium is not figured either by Edwards or Goetghebuer, a sketch is given above (Fig. 10).

It is interesting to note that *P. barbitarsis* is recorded from Spitzbergen by Edwards (1924, *Ann. Mag. Nat. Hist.* (9) **14**: 174).

ORTHOCLADIINAE.

3. *Metriocnemus fuscipes* (Mg.), 1 male.
4. *Spaniotoma* (*Trichocladius*) *rufiventris* (Mg.), 2 males.
5. *Spaniotoma* ? sp., 2 large yellow females.

CHIRONOMINAE.

6. *Pentapedilum nubens* Edw. This species and *C. lugubris* were second only in numbers to *Pentaneura barbitarsis*. Dr. Edwards records *P. nubens* from Lakes Windermere and Killarney and from Rannoch. The wing markings are particularly distinct in some of the females, and in the field the insects were mistaken for *Polypedilum* until subsequent examination revealed the presence of macrotrichia on the wings.
7. *Chironomus lugubris* Zett. Numerous males and females. Some are a shade lighter in colour than usual, so as to be intermediate between *lugubris* and *riparius* Mg. This form is only an 'arctic' variety of *riparius*. Edwards has recorded *lugubris* from Spitzbergen (1922, *Ann. Mag. Nat. Hist.* (9) **10**: 199, and 1924, *ibid.* (9) **14**: 165).
8. *Chironomus claripennis* Mall. (Edw.). Two males in poor condition appear to be this little known species, and the hypopygium agrees closely with the figure given by Edwards, who records it from Windermere and Skirwith, Cumberland, and at the same time refers to a typical specimen from Iceland. This species is not recorded from Iceland by C. H. Lindroth (1931, 'Die Insektenfauna Islands und Ihre Probleme,' Uppsala), in whose work *P. monilis*, *P. barbitarsis* and *Met. fuscipes* are amongst the Chironomidae recorded. W. D. HINCKS.

Lycaenopsis argiolus (Linn.) (Lep.) in Leicestershire in 1936.

It may be of interest to record the capture of a holly blue at Barrow-on-Soar on 17th May. The species was observed as early as 23rd April this year, and this is, as far as I know, the first record for this locality. C. J. TATHAM.

Scottish Chrysopidae (Neuropt.) in 1935.

During the past season my observations on Chrysopidae were restricted to two counties, namely Midlothian and Argyll, v.c. Kintyre (Tayvallich district). Two visits were made to the latter locality. In the first, from 11th May to 7th June, there was a week of exceptionally cold weather in the middle of May, which evidently retarded the emergence of these insects. Only five examples, representing three species of *Chrysopa,* were taken, a miserable result compared with that of the spring of 1933, although in the present year our stay was longer and collecting extended over a wider area of seemingly favourable ground. On the second visit, from 24th September to 7th October, it was realized beforehand that the season was too far advanced, and rainy weather prevailed most of the time : no imago of *Chrysopa* was seen.

The summer, however, proved to be suitable for all the species, and in Midlothian during the second half of June and in July *C. flava, ciliata* and *albolineata* (=*tenella*) appeared in numbers much over the average. Many Chrysopid larvae were noted in both counties in September and October.

Chrysopa carnea, if not so abundant in Midlothian as in 1933, was quite common here. But, as indicated above, it was not met with in Kintyre, although it was specially sought after as often as collecting was at all possible, which I think may be regarded as good presumptive evidence of its non-existence there.

MIDLOTHIAN.

Chrysopa flava (Scopoli) : 15.vi to 20.viii. In fair numbers in woods at Roslin and Balerno and in Edinburgh gardens; most numerous in July and first week of August. Larvae seen up to 18th October.

Chrysopa vittata Wesmael : 22.vi to 2.viii. Roslin and Arniston; not as common as the preceding and occurring singly as a rule. Larvae, however, were not infrequent in the early autumn.

Chrysopa ciliata Wesmael : 19.vi to 4.ix. In Roslin woods very common in the latter part of June and most of July, males preponderating up to the end of June; only odd specimens found in August and September, all females.

Chrysopa albolineata Killington (= *tenella* Schn.) : 19.vi to 13.viii. Roslin woods, fairly common; most numerous in second half of July. Perhaps on the whole a species appearing a little later than *ciliata*; it may, however, have been overlooked sometimes in the earlier period of its occurrence, as *ciliata* was then very common and no attempt was made to overhaul all the smaller Chrysopids seen at that time.

Chrysopa carnea Steph. : from 20.viii to 21.ix. Common in and around Edinburgh. On my return from Kintyre in

October I found it was still present in my garden, and about half-a-dozen were seen at Roslin on 18th of that month, the last date on which I looked for it.

ARGYLL-KINTYRE : Tayvallich district.

Chrysopa flava : 3.vi ; one female. (This species was not included in my previous Kintyre lists.)

Chrysopa vittata : 20.v. ; one male.

Chrysopa ciliata : 22.v, 1.vi and 6.vi ; three males.

It may be worth mentioning that since the above was written my attention was called on the evening of 12th December to a *Chrysopa* at rest on the wall of a room in this house — facing south and the garden. Of course it proved to be *C. carnea* and it was fairly lively when taken. Whether it had come in quite recently by the often-open window or had just changed its position in the room, in either case no doubt moved by a temporary rise in the temperature, it had certainly not been long on the spot where it was found. The curious feature is that it showed no touch of the *carnea* condition which one usually associates with specimens which turn up in winter : it is in the normal green with pale dorsal band, the reddish colour confined to the front of the head — practically to the genae and sides of the clypeus. I had been disposed to consider this as a quite exceptional case, but I see J. L. Lacroix (1926, *Bull. Soc. Sci. Nat. Ouest France* (4) **6**: 1-24) says that all the hibernating examples do not necessarily reach the *carnea* stage or even approach it. On the other hand, he indicates that sometimes the change towards *carnea* is already incipient at the end of August, increasing in September and becoming more accentuated in October. This does not apply well to the series taken here between 20th August and 18th October, in which the September examples show little or no perceptible tendency to change : only those taken on the last-mentioned date show a slight but quite noticeable increase in the red, the pale line on the dorsum of the thorax being narrowly bordered by that colour. These last were beaten from oak foliage and were not at all lethargic when disturbed.

KENNETH J. MORTON.

The use of sweep net samples in an Ecological Survey.

Standardisation of sampling techniques should be made for each area used in the investigation of the distribution of fauna and flora since the type and nature of dispersal of forms differs greatly in different habitats. The present study here presented is an analysis of preliminary investigations regarding this subject on the animal communities of several grassland habitats at Headington Wick, near Oxford. The method under scrutiny is that of the use of sweep-nets, and the optimum size of sample necessary to give an adequate representation of what is present.

Sweep-net samples (*i.e.*, the population taken in a given number of sweeps over a given area) include only such animals as may be active in the upper grass strata, and hence are indicative of the state of activity and presence of certain species; they cannot be used as a basis for the measurement of the absolute population density. The method is very useful in comparing the differences between faunas and their relative abundance from season to season, and from place to place.* Many factors influence the number of individuals taken in a particular sample: the nature of the weather and of the vegetation, as well as the personal co-efficient of error in sweeping. These factors lead to certain natural and expected deviations from the ideal and the data so obtained may at first seem rather meaningless. It is for this reason that certain workers, *e.g.* De Long ('32) and Gray and Treloar ('33), have deprecated the use of this method for practical investigations. Zubareva ('30) called attention to the part played by the human factor in the making of samples by sweeping; this work, which is essentially substantiated by the present paper, showed that certain collectors may be more consistent in their collecting results than others, and further, that some persons will consistently obtain greater numbers in their samples than others. In the Table I the individual collectors are indicated with their collections.

Thus we see that the optimum sample (*i.e.*, the sample in which is obtained the greatest number of species and individuals for the smallest number of sweeps, with the least degree of error) may vary in different habitats. Also since the composition and magnitude of an active population may change rapidly, and since weather conditions affect the activity of invertebrates, it is necessary to determine the optimum sample from a series taken simultaneously. The authors are much indebted to the following students in the Department of Zoology and Comparative and the School of Forestry, Oxford: Miss D. Dow, Miss S. B. Andrews, Mr. H. G. Vevers, Mr. A. D. W. Sandison and Mr. T. W. Summers.

The method involved essentially the use of a series of samples of different numbers of sweeps taken by several persons at the same time and in the same habitat. This operation was undertaken on two different habitats on three days (May 9, 11 and 18, 1936), each day differing somewhat as regards weather conditions.

1. The Habitats. (i) The *Holcus* community occupied the larger of the two habitats studied; it was dominated largely by the grass which gives the community its name. The average height of the vegetation is about 10 cm. Samples taken here

* For a further discussion on results which may be obtained by the sweep net method, see Carpenter, *Journ. Anim. Ecology*, November, 1936.

TABLE I.

Individual Catches.

Holcus community.

No. of sweeps in sample.	Number of animals per sample. 1st day. A	B	C	2nd day. B	D	E	F	3rd day. A	C	F	G	Total means for all days (indiv. samples).
25	10	4	8	5	3	9	4	16	9	6	4	7.09 ± 1.07
50	10	2	6	10	24	18	16	34	22	17	8	15.18 ± 2.79
75	24	14	24	23	15	17	23	37	12	16	21	20.54 ± 2.11
100	22	15	27	14	27	33	72	35	5	14	29	26.63 ± 5.33
125	22	26	48	43	11	30	34	55	8	11	20	28.00 ± 3.78
150	13	17	31	47	47	47	83	53	37	19	15	37.18 ± 6.45
						Exposed area.						
50	19	11	38	22	17	15	18	28	72	10	10	23.63 ± 5.46
75	22	13	52	37	22	39	57	31	48	10	9	30.90 ± 5.16
100	39	18	63	43	19	42	74	59	55	11	11	39.45 ± 5.30
125	14	12	13	43	61	115	122	44	80	16	19	49.00 ± 12.36

TABLE II.

Daily Means ± Standard Errors.

Holcus community.

No. of sweeps in sample.	Mean number of animals per sample per day. 1st day. Mean ± S.E.	2nd day. Mean ± S.E.	3rd day. Mean ± S.E.	Mean of three days.
25	7.33 ± 1.82	5.25 ± 1.31	8.75 ± 2.62	7.11 ± 1.18
50	6.00 ± 2.31	17.00 ± 2.88	20.25 ± 3.89	14.41 ± 4.31
75	20.66 ± 3.33	19.50 ± 2.06	21.50 ± 5.48	20.55 ± 0.73
100	21.33 ± 3.47	36.50 ± 12.48	20.75 ± 6.71	26.19 ± 5.12
125	32.00 ± 8.08	29.50 ± 6.72	23.50 ± 8.51	28.33 ± 2.52
150	20.33 ± 4.67	56.00 ± 9.00	31.25 ± 8.96	35.86 ± 10.55
		Exposed area.		
50	22.23 ± 8.02	18.00 ± 1.47	30.00 ± 14.63	23.41 ± 3.51
75	29.00 ± 11.79	37.75 ± 7.16	24.50 ± 9.33	30.75 ± 4.21
100	40.00 ± 13.00	44.50 ± 11.29	34.00 ± 13.30	39.50 ± 2.73
125	13.00 ± 0.57	82.75 ± 18.14	39.75 ± 13.33	44.87 ± 20.32

TABLE III.

Percentage Standard of Error of Daily Means.

Holcus community.

Number of sweeps in sample.	Percentage standard error of daily means. 1st day.	2nd day.	3rd day.	% S.E. of total means.
25	24.77	25.02	29.94	14.30
50	38.50	16.94	19.21	29.92
75	16.14	10.56	27.16	3.54
100	16.31	27.16	32.32	19.55
125	25.25	22.26	36.21	8.90
150	22.97	16.07	28.67	29.43
		Exposed area.		
50	36.06	8.16	48.76	15.36
75	40.65	18.48	38.08	13.68
100	32.50	25.37	39.12	7.75
125	4.38	21.92	33.55	45.26

were eleven each of 25, 50, 75, 100, 125, and 150 sweeps, three being taken the first day, and four on the other days. (ii) The exposed area which was the other habitat studied was much smaller than the *Holcus* area, and was dominated by many small rosette plants of mixed species; the vegetation here was in no place more than 4 cm. high. In this habitat there were two very abundant insects, *Ancylis comptana* Fröl. (Tortricina), and a Tipulid, whose distribution will be discussed in a later paper. There were no species similarly consistent and abundantly present in the former habitat during the season under discussion.

2. Reliability of Different Sized Samples. Table I gives the total number of organisms taken by various collectors in different sized samples on the three days in both areas. In Table II these results are expressed as daily means for each size of sample together with their respective 'standard errors' ($\frac{S}{\sqrt{n}}$, S being calculated from the formula for the standard deviation). In Table III these standard errors are expressed as percentages of mean samples. In the fourth column of means for all three days, the S.E. expresses the variation between daily means, not as in the corresponding column of Table I which lists variation between individual samples.

From these tables it is evident that in the *Holcus* habitat a sample of 75 sweeps is the most reliable, the variations between samples of this size being least on the first two days, and second lowest on the third day. Moreover, the variation of daily means shows a greater consistency for this sample than for any other. In the exposed area the errors are greater but it appears that in this case the most consistent results are to be obtained with a sample of 100 sweeps.

3. The Personal Factor. It is evident from Table I that there are great differences in the results obtained by different persons. This depends to a certain extent on experience. On the first day the largest collection was obtained by the most experienced person (*C*), and similarly on the second day by *F;* but on the third day when *C* and *F* were both operating they obtained the lowest figures. It was thought also that the consistently low figures by all three persons for the largest samples in both habitats on the first day may have been due to fatigue, but this effect was not evident on either of the other days.

4. Deviation of the Mean Collection for each Day from the Total Mean for each Habitat. The apparent lack of random dispersal on the part of the population was, on first examination, rather evident. It was found on close examination, however, that the 'patchiness' of distribution differed some-

what under the weather conditions of the three days studied. The theoretical number of animals which should have been obtained per sweep was determined for each day's collection for

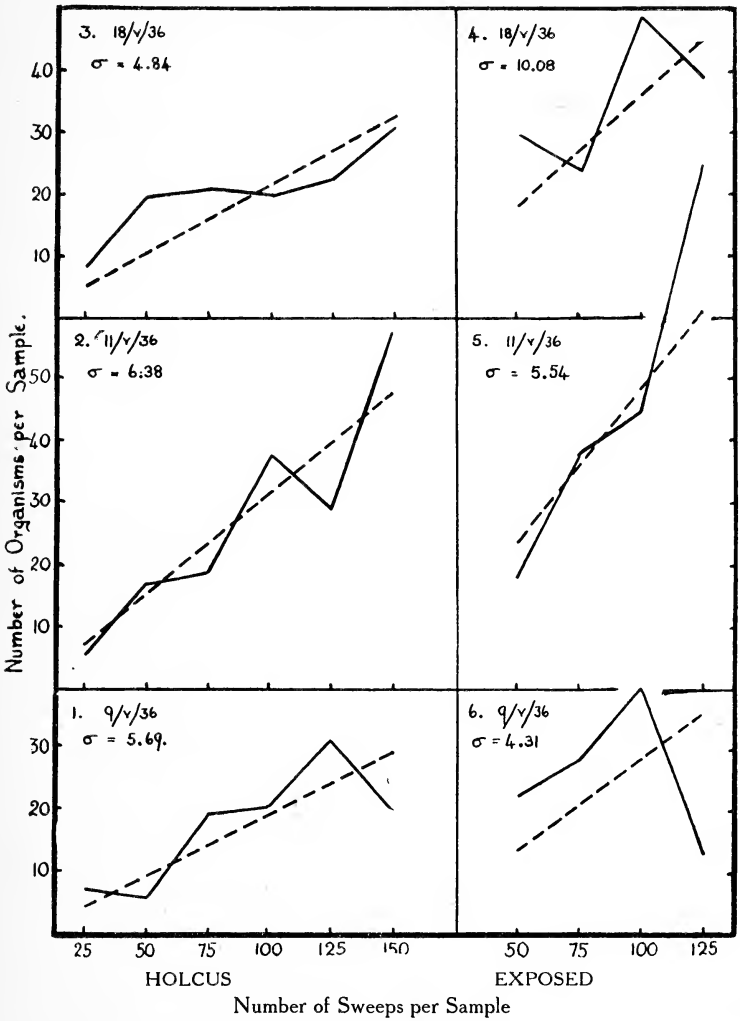


FIG. 11.—Headington Wick Grassland.

each habitat. This was done by calculating the number of animals taken in an average single sweep and multiplying by the number of sweeps taken. From this calculation was ob-

tained the number of animals which might have been expected had the distribution been at random (represented by the broken lines in Figs. 11 and 12). From the difference between the mean of all samples of a given size for a given day and the expected for that size the standard deviation (σ) was found.

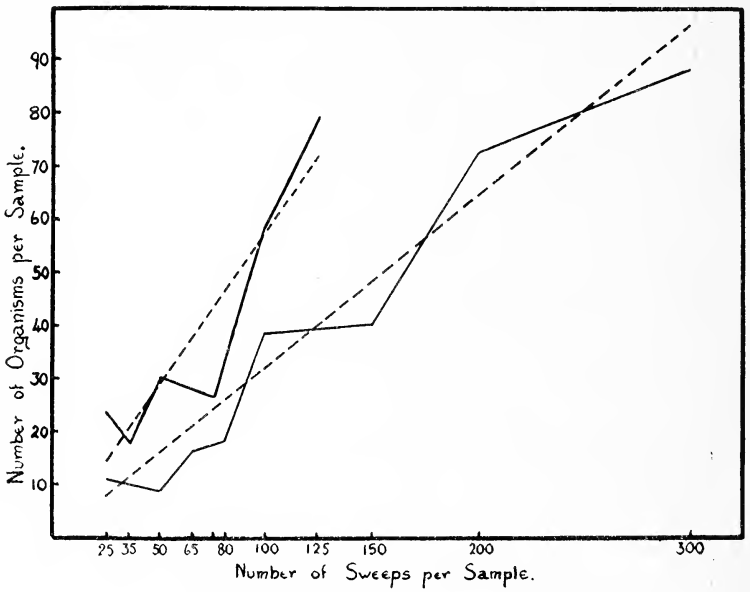


Fig. 12.—Oklahama Prairie Grassland.

This is given as an index of the degree of patchiness, or the extent to which the actual condition of dispersal differed from the theoretical random (see Table IV).* Both the theoretical and obtained figures are shown in Fig. 11 for the *Holcus* (graphs 1-3) and Exposed (graphs 4-6) stations in the three sets of collections.

TABLE IV.

Variation between daily mean samples taken and expected, in terms of σ, with accompanying data on weather.

	9/iv.	11/iv.	18/iv.
Holcus	5.69	6.38	4.84
Exposed	4.31	5.54	10.08
T° F. (4 ft.) ...	51°	68°	70°
Rel. Humid.	82%	40%	42%
Sky	Dull	Bright	Bright
Wind	—	—	+

* In this argument the personal factor was considered as being overcome or at least greatly reduced since the daily means were used instead of the individual catches.

This would appear to show that the degree of dispersion of populations is not constant but varies with the kind of day, and differently in different habitats.

(In a former study on two prairie habitats (Carpenter ('36), available in literature only as an abstract) a somewhat similar result was obtained. Samples of 25 to 300 sweeps showed that for the most abundant species the deviation of the individual collection from the mean set by all of the collections was 10 per cent. of that of the total population from a similar mean. The 'abundant' species comprised 91 per cent. of the population in one series of observations and 62 per cent. in the other. The number of individuals obtained with larger numbers of sweeps increased in a manner similar to the Headington Wick observations (Fig. 12). The angle of the curve is in all cases dependent on the population density.)

Summary. This study is a portion of an investigation dealing with the animal population of a grassland area at Headington Wick, Oxford. The value of sweep-net samples is discussed and data is presented from the results obtained by a number of sweepings of different sizes taken at the same time for two habitats. By use of the standard deviation from theoretical and obtained means it was found that the most reliable number of sweeps to obtain a representative sample of the invertebrate population in the vegetation in a *Holcus* community was 75 sweeps, and for a rosette-plant community, 100 sweeps. Personal error was found to be important and not altogether consistent from day to day. The degree to which animals disperse themselves from a random distribution in the vegetation varies under different kinds of weather conditions and differently in different habitats. This method is recommended by the authors as a simple and fairly efficient as well as rapid means of sampling and comparing areas under reconnaisance.

References.

Beall, G. 1935. Study of arthropod populations by the method of sweeping. *Ecology*, **16**: 216-225.

Carpenter, J. R. 1936. Some observations on the number and size of samples necessary to make an adequate sampling of a prairie biotic community (abstract). *Proc. Okla. Acad. Sci.*, **15**: 31.

De Long, D. M. 1932. Some problems encountered in the estimation of insect populations by the sweeping method. *Ann. ent. Soc. Am.*, **25**: 13-17.

Weese, A. O. 1936. Application of mathematical concepts to communities: an application of Kylin's methods to animal communities. *Publ. Univ. Okla. biol. Surv.* (in press).

Zubareva, S. P. 1930. Statistical evaluation of the method of quantitative entomological collection by sweepnets. *Bull. Inst. Rech. biol., Perm.*, **7**: 89-104. [In Russian, English summary.]

J. Richard Carpenter and John Ford.
(*Department of Entomology, University Museum, Oxford*).

List of Insects found near Aviemore, Inverness-shire, from June 20th to July 2nd, 1933.

Owing to a misunderstanding, this 'List' was published (1936, *J. Soc. Brit. Ent.*, **1** (5): 131-141) without the specialist revision some parts should have undergone. Certain corrections are, therefore, rendered necessary. Mr. J. E. Collin has very kindly examined some doubtful Diptera, often in a bad state for determination, and the following alterations must be made as a result of his examination:

'*Spilogona grandis*' = *Spilogona curata* Coll., ♀.
"*Fannia hirticeps*' = *F. tuberculata* Ztt., ♀.
'*Coenosia octopunctata*' = *C. geniculata* Fln.
'*Orthachaeta pilosa*' = *Coenosia trilincella* Ztt., ♀.
'*Pselaphila loewi*' = *Trichopalpus punctipes* Mg. ♀.
'Nr. *Cosmetopus*' = *Pogonota hircus* Ztt., ♀.
'*Blepharoptera variabilis*' = *B.* (or more usually, now, *Leria*) *flavo testacea* Ztt.
'*Chlorops ringens*' = *C. meigenii* Lw.
'*Oscinis laevigata*' = *O. atricella* Ztt.

Of the two species of *Phora* the '? *P. nudipalpis*' is *Aphiochaeta sordida* Ztt., and the '? *P. aptina*' is a different species of *Aphiochaeta* (NOT *aptina*), but its condition is such as to render identification almost impossible (J.E.C. *in litt.*).

F. H. HAINES.

Early records of Vanessa atalanta L. (Lep.).

I give below three records of *Vanessa atalanta* in the early part of the year. The Ponghill record is to me convincing proof of hibernation in England.

(1) Ponghill, near Bude, Cornwall. A butterfly, unchipped and looking very little faded, was watched by me, in company with my brother, for some time, flitting about and settling, in a lane on 18th February, 1927.

(2) Badbury Rings, Dorset. One seen at intervals by me visiting blackthorn blossom on 27th April, 1929.

(3) One captured by my housekeeper, basking on a Cotoneaster by my front door, near Bere Regis, Dorset, on 25th March, 1934.

H. L. ANDREWES.

Breeding records of Hymenoptera and Diptera.

(1) PARASITES OF VANESSA URTICAE (L.).

Seventeen pupae were found on the black boarding of a barn, above a bed of nettles, near Flimwell, E. Sussex, 17th Aug., 1935. On 25th Aug., a ♂ butterfly emerged, but the others were parasitised as follows: — three produced Tachinid puparia on 22nd Aug., giving 7th Sept. 1 ♂ and 9th Sept.

2 ♀♀ of *Compsilura concinnata* (Mg.); the others gave broods of *Pteromalus puparum* (L.), 19th Aug. 42 ♂♂ 59 ♀♀, 23rd Aug. 184 ♂♂ and 20 ♂♂ 43 ♀♀, 24th Aug. 94 ♂♂ 69 ♀♀, 30th Aug. 14 ♂♂ 26 ♀♀, 4th Sept. 11 ♂♂ 63 ♀♀ and 11 ♂♂ 79 ♀♀, 5th Sept. 13 ♂♂ 51 ♀♀, 7th Sept. 67 ♂♂, 9th Sept. 16 ♂♂ 58 ♀♀, 10th Sept. 7 ♂♂ 54 ♀♀, 12th Sept. 3 ♂♂ 30 ♀♀ and 7 ♂♂ 15 ♀♀. In the two broods on 12th Sept. two parasite larvae were still left in the empty chrysalis and would perhaps have hibernated there.

Three pupae of *V. urticae* collected on a brick wall at Slough, Bucks, 9th Aug., 1935, by Miss K. Kirby, produced the following: — 22nd Aug., *V. urticae*; 23rd Aug., ♂ *Compsilura concinnata* (Mg.) and 22 ♂♂ 6 ♀♀ *Pteromalus puparum* (L.).

(2) Other records of Compsilura concinnata (Mg.), bred by Mr. D. W. Mollison.

A larva of *Mamestra pisi* (L.) collected on a young birch at Slough, Bucks, 27th July, 1935, produced a Tachinid puparium on 16th Aug. and a ♂ fly on 2nd Sept., 1935.

A larva of *Porthesia chryssorrhoea* (L.) collected on birch at Stoke Common, Bucks, 26th June, 1935, spun up on 5th July, 1935. A ♀ fly emerged on 17th July, 1935.

(3) Parasites of Taeniocampa miniosa (Fab.) from Warley Common, Essex, bred by Mr. T. P. Eagles.

The following specimens reached me through the kind offices of my friend Mr. Brett. It is not clear in all cases whether one or more specimens of the parasites came from a single host.

Pales pavida (Mg.), 3 ♂♂ 1 ♀, 'ex. pu. *Taeniocampa miniosa,* la. 6th June, 1934, em. July, 1934'; 1 ♀ with the same data; 2 ♂♂ 'la. full grown, May, 1934, em. July, 1934.'

Voria trepida (Mg.), ♀, 'ex. *miniosa.*'

Ptychomyia selecta (Mg.) var. *fugax* (Rdi.), ♀, 'la. May, 1934, fly June, 1934.'

Microplitis tuberculifera Wesm., 1 ♂ 9 ♀♀, 'la. May, 1934, em. June, 1934, one per la.'

Mr. Eagles also sent a specimen of *Phryxe nemea* (Mg.) ♀ (det. Mr. C. J. Wainwright) bred from the larva of *Dianthoecia* sp., ? *D. capsincola* (Hübn.), at Chalfont, Bucks.

(4) A parasite of Lycaenopsis argiolus (L.).

Larvae of the above butterfly were rather common on ivy-buds at Slough in Sept., 1934. They were easily detected by searching for buds that had been a little eaten, when a young larva was usually found sitting nearby. Of the six larvae collected between 1st and 11th Sept., four produced butterflies in the spring, one died as a pupa and one produced a ♂ of *Listrodromus nycthemerus* (Grav.) (det. Mr. J. F. Perkins) on 20th May, 1935. This is a well-known Lycaenid parasite. Larvae

collected at the same time by my friend Mr. W. H. Goddard and kept indoors produced a number of *Listrodromus* between 20th Oct. and 20th Nov., 1934.

(5) Hosts of two Pimplinae.

A folded leaf of apple containing the larva of *Ornix guttea* (Haw.) was collected at Slough, Bucks, 18th July, 1935, and produced *Scambus nucum* (Ratz.) ♂ in Aug., 1935.

A blotch of *Lithocolletis corylifoliella* (Haw.) collected on the same tree on the same date produced *Itoplectis alternans* (Grav.) ♂ in August, 1935.

Both Ichneumonids were kindly determined by Mr. J. F. Perkins.

(6) Breeding records of Trypetids.

Some heads of *Hypochoeris radicata* L. collected at Slough, Bucks, 26th June, 1935, produced: *Tephritis vespertina* Lw., 8th July 1 ♂, 9th July 1 ♂ 1 ♀, 10th July, 1935, 1 ♂. The infected heads fail to open, but otherwise look normal. Twenty-seven heads collected off a single large plant at Slough, 9th July, 1935, produced: 11th July 1 ♂ 1 ♀, 12th July 5 ♂♂ 2 ♀♀, 13th-15th July 3 ♂♂ 6 ♀♀, 16th July 3 ♂♂ 3 ♀♀; *Eurytoma curta* Walk., 19th July 1 ♂, 20th July 1 ♀, 22nd July 1 ♀.

Some seedling heads of *Arctium lappa* L. were collected at Ivinghoe Beacon, Bucks, 2nd Sept., 1934. Many of the heads were evidently swollen and abnormal. They produced: *Tephritis bardanae* (Schr.), 4th Sept. 3 ♂♂, 6th Sept. 2 ♂♂ 2 ♀♀, 8th Sept. 2 ♂♂ 3 ♀♀, 10th Sept. 1934 1 ♂ 1 ♀; *Orellia tussilaginis* (Fab.) 39 ♂♂ 38 ♀♀, emerging between 9th June and 4th July, 1935; *Habrocytus trypetae* Thoms., 3rd June, 1935, 5 ♀♀, 9th-10th June, 1935, 1 ♀. Some flower-heads of *Hieracium umbellatum* L. at Stonor Woods, Oxon, 9th Sept., 1934, were seen to be abnormal, resembling a large bud about to open. They were found to contain larvae, so a number were collected. They produced: *Noëeta pupillata* (Fall.), 22nd May, 1935, 1 ♀, 27th May 2 ♂♂ 5 ♀♀, 5th June, 1935, 1 ♀; *Habrocytus trypetae* Thoms., 22nd May 3 ♂♂, 27th May, 1935, 1 ♂.

Some seed heads of *Rosa* sp. (wild species) collected at Bledlow Ridge, Bucks, 9th Sept., 1934, produced on 7th June, 1935, *Rhagletic alternata* (Fall.), 1 ♀. O. W. Richards.

Araujia sericifera Brot. and its Insect Visitors.

Since the appearance of my paper under the above title in 1934, *J. Soc. Brit. Ent.*, **1** (2): 55-61, Mr. W. J. Bean of Kew has told me that the correct form of the specific name is *sericofera*, and it so appears in his 'Trees and Shrubs Hardy in

the British Isles' (Lond., 4th ed., **1**: 200). On looking through the bibliography of entomological notes and papers in 1935, *Trans. Soc. Brit. Ent.*, **2** (2): 167-233, I noticed on p. 205 a reference to the 'Capture of *Chærocampa celerio* at flowers of *Geranium* and *Physianthus,*' recorded in 1865, *Naturalist,* **2**: 210, where I found the following note:

'. . . I took one in 1846 fast by the proboscis in a flower of *Physianthus albicans* [*sic*], the flowers of which are excellent insect capturers. These flowers are very sweet and attractive, and the stamens are so placed that the slightest touch by the proboscis of an insect entering the nectary causes them and the anthers to close firmly round it. I have seen this plant with dozens of insects upon it, *Plusia gamma* in abundance.—R. C. Kingston, Brantingham Garden, near Brough, East York. 4th October, 1865.'

It seems to be the fate of this plant to have its method of trapping insects misrepresented, for, had Mr. Kingston studied the matter more closely, he would have found that the trapping was by no means such an easy and simple process as he appeared to think, and that the plant has no anthers as generally understood, but a specialized mechanism of very modified anthers by which the insects are trapped. In my paper I mentioned *Hippotion celerio* L., amongst other hawkmoths, as having been recorded as trapped, and it is interesting to have an authentic case in Britain.

I may mention that my large plant of *Araujia* was badly infested with an *Aphis* sp. in the early part of this year and I had to spray it with a lime-sulphur wash; this cleared it, and the plant soon showed its appreciation by growing well and flowering freely, but the opening of the first flower was about a fortnight later than last year owing to the *Aphis* attack. Insect victims this year consisted of four specimens of *Rhingia campestris* Mg. only, although *Plusia gamma* L. was common from July until November (judging by the number of wings left by the bats in our verandah) and hive bees were busy amongst the flowers daily.

C. Nicholson.

A Further Record of the Hemiptera Heteroptera collected at the Imperial College Biological Field Station, Slough, Bucks.

Since my last paper published in 1935, *Trans. Soc. Brit. Ent.*, **2** (1): 47-67, the following species have been recorded at the Field Station. Species marked with a dagger are not recorded for the county of Buckinghamshire in E. A. Butler, 1923, 'A Biology of the British Hemiptera-Heteroptera,' London.

1. *Acanthosoma tristriatum* L. Collected on clothes after collecting on hazel bushes. 22.x.1935.

2. *Coreus denticulatus* Scop. Collected on grass under privet hedge. 3.vi.1935.
3. *Neides tipularius* L. Collected hibernating in grass. 11.ii.1935.
† 4. *Cymus melanocephalus* Fieb. Collected in grass. 26.iv.1935.
5. *Ischnorhynchus resedae* Pz. Collected hibernating in *Pinus sylvestris* L. 15.i.1935.
6. *Rhyparochromus chiragra* Fab. Collected on grass bank under privet hedge. 3.vi.1935.
7. *Tropistethus holosericus* Schltz. Collected on grass bank under privet hedge. 3.vi.1935.
8. *Peritrechus geniculatus* Hahn. Collected hibernating in grass. 20.i.1935.
† 9. *Scolopostethus grandis* Horv. Collected in grass. 20.i.1935.
10. *Notochilus contractus* H.S. Collected on grass bank under privet hedge. 3.vi.1935.
†11. *Drymus silvaticus* var. *ryei* D. and S. Collected in gravel pit. 17.vii.1935.
12. *Piesma capitata* Wolff. Collected in grass on lawn. 7.v.1935.
13. *Monanthia cardui* L. Collected in grass. 10.iv.1935.
14. *Derephysia foliacea* Fall. Collected on *Hedera helix* L. 9.x.1935.
†15. *Microphysa elegantula* Baer. Collected on horse chestnut, crawling over lichen on bark. 10.vii.1935.
†16. *Dicyphus globulifer* Fall. Collected on *Lychnis dioica* L. 9.v.1935.
17. *Phytocoris dimidiatus* Kb. Collected on sugaring mixture on apple tree. 3.viii.1935. Although I have looked frequently in the daytime, I have collected this species only after dark.
18. *Velia currens* Fab. Collected on stream. 3.iv.1935.

W. H. Goddard.

Eupithecia distinctaria Herr.-Schäff. (Lep.).

This species has for many years been regarded as including *constrictata* Guen. R. South in his popular work, 1908, 'The Moths of the British Isles,' Lond., **2**: 229, pl. 95, fig. 4, so treats it. H. T. Stainton in 1859, 'A Manual of British Butterflies and Moths,' Lond., **2**: 88, refers only to *constrictata* Guen. O. Staudinger and H. Rebel in 1901, 'Catalog der Lepidopteren des Palæarctischen Faunengebietes,' Dritte Auflage, Berlin, **1**: 311, No. 3,556, sink *constrictata* Guen. and *sextiata* Mill. to *distinctaria* Herr.-Schäff., without giving any indication that *sextiata* Mill. is usually regarded as at any rate a good geographical race.

E. Meyrick, 1895, 'A Handbook of British Lepidoptera,' Lond., 193, No. 27, regards *constrictata* Guen as a separate

species peculiar to the British Archipelago, but in his second edition (1927), p. 228, No. 26, he has recanted this view and sunk *constrictata* Guen., to *distinctaria* Herr.-Schäff. L. B. Prout, in A. Seitz, 1914, 'The Macrolepidoptera of the World,' Stuttgart, **4**: 291, adopted the same course, but unlike Staudinger and Rebel (*l.c.*) regards *sextiata* Mill. as a southern form of sufficient distinctness to warrant the name being retained. L. Lhomme in 1923-1935, 'Catalogue des Lepidoptères de France et de Belgique,' **1**: 546, No. 1,391, follows the same course as L. B. Prout. J. Culot, 1919-1920, 'Noctuelles et Géomètres d'Europe,' Geneva, **4**: 16, pl. 39, fig. 809, 810, whilst treating *distinctaria* Herr.-Schäff. as = *constrictata* Guen., states: 'La forme *sextiata* Mill., que l'on trouve dans le sud de la France, considérée par differents auteurs comme une espèce distincte et par Dietze comme une simple variété de *distinctaria*, est a peine differente de cette dernière.' In connection with the second part of my List of the Lepidoptera of Dorset which I hope to publish in the Transactions of the Society for British Entomology this year I was driven by the confusion of the records of *Eupithecia* to adopt the practice of mounting the genitalia where possible, and I thought it worth while, whilst I was doing this, to check the Dorset material against such Continental material as I possessed. I found two things: first, that the figure given by F. N. Pierce, 1914, 'The Genitalia of the Group Geometridae,' Liverpool, 44, where he treats *distinctaria* Herr.-Schäff. and *constrictata* Guen. as the same species, at pl. 27 is rather misleading as it shows only the upper portion of the plate on the 8th abdominal segment and not the whole plate, and, secondly, that the Continental specimens at my command did not show the same type of plate. I venture the opinion that Pierce's drawing was taken from an insufficiently stained specimen, the proximal part of the plate is very slightly chitinized and difficult to see if not sufficiently stained. I have figured the entire plate. The Continental specimens I have, so far as they are males, are entirely referable to *sextiata* Mill. and they

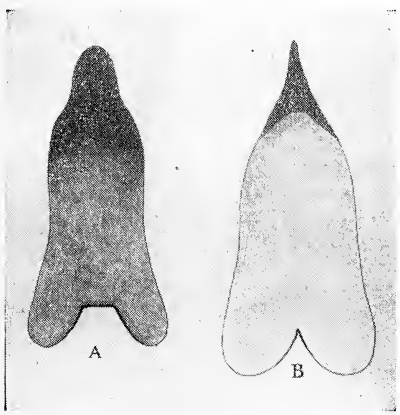


Fig. 13. A.—Plate of the eighth abdominal segment of the male of *Eupithecia distinctaria* Herr.-Schäff. B.—The same of *E. constrictata* Guen.

have, as can be seen from the figure, a much blunter distal end, and the whole plate, but especially distally, is much more heavily chitinized; on the other hand, as the figures show, it is distinctly smaller. Mr. Prout, to whom I mentioned the matter, told me that he had not investigated the question, but had for some time held the view that *constrictata* Guen. was quite readily distinguishable superficially, and he asked me to investigate the matter further and publish my results. I have accordingly mounted a number of British specimens from various localities, and they one and all have the lightly chitinized and pointed plate. Unfortunately I have not been able to carry my investigations into Continental material any further. I dissected the few additional specimens I possessed, but they were all females. Mr. W. Fassnidge lent me the few he had. His British specimens were correctly referred to *constrictata* Guen. and showed the typical British plate. His Continental specimens identified by European entomologists were few in number, wholly of the female sex and not one of them referable either to *distinctaria* or *constrictata*. So far I have not found a material distinction in the females of the specimens referred to these names. My investigations therefore show only that the British form of plate is constant for these islands, that *sextiata* Millière is distinct, with a distinct form of plate; but that still leaves open a possible other blunder, *viz.* that *sextiata* ought not to be sunk to *distinctaria* and does not really settle whether *distinctaria typica* is distinct from *constrictata*. The loan of Continental *distinctaria* with permission to dissect them is, therefore, a desideratum. I might add that the range of food-plants gives one further room for doubt: on flowers of *Thymus* (Meyrick), *Thymus vulgaris* and *T. serpyllum* (Culot, Prout), *Laserpitium gallicum, Pastinaca urens* (Chrétien), *Solidago, Peucedanum oreoselinum* (Moench). Surely a strange range for one species of very local distribution.

W. Parkinson Curtis.

Syzeuctus maculatorius F. (Hym., Ichneumonidae) bred from Epischnia bankesiella Rich. (Lep., Phycitidae).

In May, 1935, Mr. S. C. Scarsdale Brown and I determined to obtain the larva of *Epischnia bankesiella* Rich., and in this we were successful, locating the insect at two points in the Isle of Purbeck, Dorset. During July there emerged from the larvae thus obtained an Ichneumonid which Mr. J. F. Perkins of the British Museum kindly identified as *Syzeuctus maculatorius* Fabr., adding, 'This is an interesting species that I have only previously seen bred from *Nepthopteryx genistella* Dup.' *Nephopteryx* belongs to the Phycitidae and is closely allied to *Epischnia*. It is to be remarked that the emergence of the para-

site from the full-fed larva and the emergence of the host from the pupa were coincident. The young larva of the host would not probably be available for the parasite till at least a month after the parasite itself emerged; one would suspect, therefore, that the Ichneumonid is double-brooded and has an intermediate host. *N. genistella* Dup. and its food-plant *Ulex europaeus* L. are both absent from the localities where *E. bankesiella* Rich. is found.

W. Parkinson Curtis.

Wild pairing of Taeniocampa gothica Linn. with T. stabilis View. (Lep.).

Whilst 'sallowing' with my friend Mr. W. H. Moody in the New Forest on 26th March, 1935, I was fortunate enough to take a female *T. gothica* in copulation with a male *T. stabilis*. They were boxed and then remained paired for about fifteen minutes.

When I arrived home I transferred the female to a roomy chip-box, and on 28th March I discovered that she had laid a small batch of fifteen eggs. I watched the progress of these very carefully and noticed a change in colour take place after two or three days, indicating that the eggs were fertile.

The eggs began to hatch on 23rd April, and during that day fourteen larvae emerged, the period of incubation being twenty-seven days. The remaining egg did not hatch.

The young larvae were given sallow, and as they took to this food readily they were reared upon it and subsequently produced thirteen pupae. The pupae were kept in a cage out of doors and exposed to all weathers until 25th January, when I thought that it would be wise to bring them indoors to prevent attack by mould. On 29th January I discovered that the first of the moths had emerged, although it did not develop fully until the following day. On 30th January the second moth emerged, and by 7th February all the thirteen pupae had produced imagines.

Of the imagines, five were males and eight females. Four emerged and developed perfectly, five were slightly undeveloped but by careful manipulation of the setting needle gave quite good specimens, the other four remained completely undeveloped.

A most interesting point to observe is that of the thirteen insects, twelve are definitely like the female parent and only one like the male parent; the latter, unfortunately, has undeveloped hindwings. Although the female characters strongly predominate in nearly all of the specimens, by careful examination one can find traces of the male markings on about 50 per cent., especially on the forewings, and this is particularly noticeable in connection with the sub-marginal line and the reniform

stigma. One good male, incidentally the first example to emerge, has the ground colour and markings of the parent male plus the usual markings of the parent female. Four of the males did not develop, and it is unfortunate, for these would have produced most interesting specimens; although the wings are undeveloped they are complete and show a cloudy diffusion with occasional black markings as in *T. gothica*.

I have made a number of enquiries about this cross pairing, and find that although similar occurrences are not unknown, the rearing of the resultant eggs has not been previously accomplished.

C. M. R. Pitman.

Sphinx convolvuli L. (Lep.) in Wiltshire, 1935.

I took two specimens of this moth in Salisbury in October, 1935, one at rest on a tennis net and the other on a wall a few doors from my house.

C. M. R. Pitman.

Attacks of birds on insects.

Whilst 'beating' a hedgerow at Bournemouth during the evening of June 20th, 1935, I chanced to 'beat' some bushes of *Euonymus japonicus* Linn., whereupon two specimens of *Abraxas grossulariata* L. fluttered out. One flew to the ground, but the other, still on the wing, had flown only about ten yards when it was seized by a blackbird, *Turdus merulus merulus* L., and carried away to a nest of young. I again began 'beating' and disturbed several more *A. grossulariata*; within ten minutes or so the blackbird returned and carried away another of the moths. Whether this is a general habit with blackbirds or not when attacks are made on moths I cannot say, but it certainly is with some sparrows, and is definitely so with spotted flycatchers and the various species of wagtails and warblers.

During a walk round Old Sarum, Wilts, one evening in 1935, I noticed that cockchafers (*Melolontha vulgaris* L.) were swarming around various bushes. I was watching these with a passing interest when I was surprised to see a yellowhammer (*Emberiza citrinella citrinella* (L.)) single out one of the insects from the rest and chase it high up in the air until the bird eventually got well above it and then drove it down to earth, where the insect was eaten. This performance I watched for a considerable time, during which the bird was responsible for five cockchafers. Incidentally, of course, several insects were missed. This is, in my experience, a remarkable deviation from the usual habits of the yellowhammer.

C. M. R. Pitman.

SOCIETY FOR BRITISH ENTOMOLOGY

List of Publications for Sale at the Nett Prices shewn.

(All prices are post free.)

SYSTEMATIC WORKS.

British Hemiptera-Heteroptera. By H. P. Jones, 1930. 88 pp., 2 Pls. 4*s.* 6*d.*

British Neuroptera. By F. J. Killington, 1929. 36 pp., 6 Pls., 6 Figs. 4*s.* 0*d.* With Supplement (*Hemerobius*), 1934, 5*s.* 6*d.*

British Tabanidae (Dipt.). By E. R. Goffe, 1930. 71 pp., 2 Pls. 5*s.* 0*d.*

British Tipulinae (Dipt.). By H. L. F. Audcent, 1932. 35 pp., 3 Pls. 4*s.* 0*d.*

Keys to British Asilidae (Dipt.). By B. M. Hobby, 1932. 6 pp. 1*s.* 9*d.*

Meigen's 'Nouv. Class.' 1800. By E. R. Goffe, 1932. 7 pp. 1*s.* 0*d.*

British Liriopeidae (Dipt.). By H. L. F. Audcent, 1934. 12 pp., 4 Pls. 1*s.* 9*d.*

British Mecoptera (Synopsis and Feeding Habits). By B. M. Hobby and F. J. Killington, 1934. 11 pp., 2 Pls. 1*s.* 6*d.*

FAUNAL LISTS.

Tortrices of Hants and I.O.W. By W. Fassnidge, 1929. 20 pp. 1*s.* 6*d.*

Macro-Lepidoptera of Hants and I.O.W. By W. Fassnidge, 1925. 42 pp. 1*s.* 6*d.*

Hymenoptera Aculeata of Hants and I.O.W. By H. P. Jones, 1926. 13 pp. 1*s.* 0*d.* With Supplement, 1932, 1*s.* 6*d.*

Paraneuroptera of Hants and I.O.W. By F. J. Killington, 1926. 9 pp. 1*s.* 0*d.*

List of British Collembola. By F. A. Turk, 1933. 6 pp. 1*s.* 0*d.*

List of Dorset Lepidoptera. By W. P. Curtis. Introduction and Part I, 1934. 102 pp. annotated. 7*s.* 6*d.*

Other Faunal Lists no longer available as separates will be found in the Transactions and Journal.

GENERAL WORKS.

'Entomology and Ethics.' By W. Fassnidge (Presidential Address, 1931), 1932. 16 pp. 1*s.* 0*d.*

Bibliography of Entom. Notes in Publications of British Local Societies. (An indispensable Supplement to the Zoological Record.)
Part I, 1933. 24 pp. 2*s.* 6*d.*
Part II, 1934. 18 pp. 2*s.* 6*d.*
Part III, 1935 (The Naturalist). 67 pp. 2*s.* 6*d.*

SERIAL PUBLICATIONS.

ENT. SOC. S. ENGL. THE JOURNAL.

Parts I–IV, 1932–33 (in all 112 pp., 1 Pl.). 2*s.* 6*d.* each.

THE TRANSACTIONS.

No. IV,	1928	4*s.* 0*d.*
No. V,	1929	7*s.* 6*d.*
No. VI,	1930	*out of print.*
Vol. VII,	Part 1, 1931 ...	7*s.* 0*d.*
Vol. VII,	Part 2, 1932 ...	10*s.* 6*d.*
Vol. VIII,	Part 1, 1932 ...	8*s.* 0*d.*
Vol. VIII,	Part 2, 1933 ...	7*s.* 0*d.*

Transactions Nos. 1—3 were issued by the Hampshire Entomological Society and are out of print. Copies, however, are sometimes available, and particulars of any on hand may be had on request.

SOC. BRIT. ENT. THE JOURNAL.

Vol. I, Part 1, May, 1934	...	2*s.* 6*d.*
Vol. I, Part 2, Oct., 1934	...	2*s.* 6*d.*
Vol. I, Part 3, April, 1935	...	2*s.* 6*d.*
Vol. I, Part 4, Oct., 1935	...	2*s.* 6*d.*
Vol. I, Part 5, March, 1936	...	2*s.* 6*d.*

THE TRANSACTIONS.

Vol. I, Part 1, June, 1934.	10*s.* 6*d.*
Vol. I, Part 2, Nov., 1934	12*s.* 0*d.*
Vol. II, Part 1, July, 1935.	12*s.* 0*d.*
Vol. II, Part 2, Oct., 1935.	12*s.* 0*d.*

The list of Contents of any Volume will be sent on request.

The Subscription to the Society, which includes copies of all matter published during the period covered, is 21*s.* 0*d.* per annum. There is no entry fee.

Orders, accompanied by the appropriate remittance, should be addressed to **E. Rivenhall Goffe,** Hon. Sec., 102, High Street, **Southampton.**

S66
Insects
JUN 23 1937
NATIONAL MUSEUM

VOL. 1. PART 7.

JOURNAL

OF THE

SOCIETY FOR BRITISH ENTOMOLOGY

EDITOR:

F. J. KILLINGTON, B.Sc., A.L.S., F.R.E.S.
F.S.B.E.

ASSISTANT EDITOR:

B. M. HOBBY, M.A., D.PHIL., F.R.E.S.

DATE OF PUBLICATION: 14TH JUNE, 1937.

Copies may be purchased from the Secretary at 102, High Street, Southampton.

Price 2s. 6d., post free.

CONTENTS.

PAGE

AUBROOK, E. W.: Anthicidae (Col.) new to Berks and Oxon. 178

——— Spiral segmentation in the immature stages of *Hipocrita jacobaeae* L. (Lep., Arctiidae) ... 186

BRANGHAM, A. N.: Formicidae (Hym.) of the New Forest .. 175

BROWN, S. C. S.: *Laspeyresia conicolana* Heylaerts (Lep.) in Hants and Dorset 190

——— *Crambus salinellus* Tutt (Lep., Pyralidina) in Dorset 190

——— Occurrence of *Cateremna terebrella* Zinck (Lep.) in Dorset 190

——— Occurrence of *Plusia moneta* Fabr. and *Aegeria tipuliformis* Clerck (Lep.) in Scotland 191

——— *Platyptilia pallidactyla* Haw. (Lep., Pyralidina) in Scotland 191

BOWES, A. J. L.: The occurrence of *Salebria obductella* F.R. (Lep., Pyralidae) in Britain 192

CALLAN, E. McC.: A Note on some Hymenoptera and Diptera bred from a dead cricket bat willow 193

CARPENTER, PROF. G. D. H., D.M., F.L.S., F.R.E.S.: A note on some parasites of *Zygaena* (Lep.) .. 176

CURTIS, W. P., F.R.E.S.: *Macroglossum stellatarum* Linn. (Lep.), a possibly hibernated specimen 172

——— *Vanessa atalanta* Linn. (Lep.), a possibly hibernated specimen 173

——— Honeycomb as a bait for moths 173

——— *Eupithecia abbreviata* Steph. (Lep.) feeding on *Neottia nidus-avis* Linn. 173

——— Cranefly and Earwig as the prey of the Blackbird 174

——— *Melolontha vulgaris* L. (Col.) as the prey of the Sparrow 174

DUMPER, E.: *Cleonus albidus* F. (Col., Curculionidae) in the New Forest, Hants 172

EASTWOOD, J. E.: *Epischnia banksiella* Rich. and *Nephopteryx genistella* Dup. (Lep.) at Hayling Is. 193

FORD, J., B.A.: Escape of Butterfly after capture by Bird 178

FRASER, F. C., LT.-COL., M.D., I.M.S.: *Sphinx pinastri* L. (Lep.) in Bournemouth 191

[*Continued on page 3 of cover.*]

JOURNAL OF THE SOCIETY FOR BRITISH ENTOMOLOGY

VOL. I. 14TH JUNE, 1937. PART 7.

RESEARCH ON THE BED-BUG:

AN APPEAL.

In connection with the bed-bug research of the London School of Hygiene and Tropical Medicine data on *Cimex lectularius* L. in relation to wild and domestic animals are being collected.

We should be grateful if readers would help by sending such material as nests of birds (pigeon, fowl, sparrow, starling, house-martin) and of rats and mice, or materials near the nests, which are likely to harbour bed-bugs. Observations concerning bugs in such situations will also be valuable whether made at home or abroad.

Material should be well and securely packed and addressed to C. Johnson, Department of Entomology, London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, London, W.C.1. All postage costs will be refunded.

HON. EDITORS.

Some records of the capture of species of the genus Helophilus (Dipt.) at Boston Manor, Middlesex.

The following record of the capture of so many species of the genus *Helophilus,* in such a limited area, may prove to be of interest to fellow-collectors.

Three years ago, at Boston Manor, Middlesex, now a suburb of London, and about twenty minutes from Hammersmith Broadway, I took specimens of *lineatus, transfugus, lunulatus,* and *trivittatus,* all females. Since then I have visited this spot regularly every May to June, and record the following species:

Helophilus trivittatus Fab.—One specimen only, a female.
,, *hybridus Loew.*—One specimen only, a female.
,, *pendulus* Linné.—Fairly common.
,, *frutetorum* Fab.—One specimen only, a female.
,, *versicolor* Fab.—Abundant in 1934.
,, *lineatus* Fab.—Always abundant.
,, *lunulatus* Mg.—Fairly common.
,, *transfugus* Linné.—Fairly common.

JUN 22 1937

It seems rather strange that the more common species, such as *trivittatus, hybridus* and *pendulus,* are less common than, for example, *lineatus,* which almost swarms there, particularly during the first two weeks in June.

It is curious to note that these insects appear to be restricted to an area about a quarter of a mile square, and that so many should occur together like this, as previous records of the rarer species seem to be rather scattered.

The locality is very damp, and the vegetation luxurious. The actual spot where I made most of my captures was in a corner of a field, bordered by a stagnant pool and a canal on one side, and the overgrown remains of an orchard on the other.

I have noticed that *lineatus* seems particularly fond of the pond, flying low over the water in large numbers, and settling on the leaves of the semi-aquatic plants. *Transfugus* was fairly common in 1934, but is apparently becoming more rare each year, as it was scarce last year, and so far this season (1936) I have seen none. A. M. Low.

Cleonus albidus F. (Col., Curculionidae) in the New Forest, Hants.

This rare species was found on the ground last summer on the outskirts of the New Forest. Mr. P. Harwood, to whom I am indebted for the determination of my specimen, informs me that he has never taken it, but distinctly remembers his late father taking at least one specimen many years ago in the Colchester district. E. Dumper.

Macroglossa stellatarum Linn. (Lep.), a possibly hibernated specimen.

On 27th March, 1936, I was in the King George V graving dock at Southampton for the purpose of seeing the Q.S.T.S. 'Queen Mary,' and whilst there a specimen of *Macroglossa stellatarum* Linn. flew between me and the ship's side. As the latter is black, and the insect was in full sunlight at about 3.30 in the afternoon, I had an excellent and close view of it. I should regard this as a specimen which had successfully wintered here. In confirmation of my surmise I might remark that a specimen was to be seen in the Bournemouth Law Library during the winter of 1904. As this room is infrequently disturbed by feminine cleaning habits, the insect rested under the cornice of the ceiling the whole of the winter until late January, when after a somewhat sunny day it disappeared. Mr. H. L. Andrewes tells me that a specimen of this species was taken in his bungalow at Champerlayne's, near Bere Regis, on the 11th April, 1935; this also seems to point to a successful hibernation.

W. Parkinson Curtis.

Vanessa atalanta Linn. (Lep.), a possibly hibernated specimen.

On 24th April, 1936, I noticed a large Nymphaline flying strongly in my garden at Bournemouth, but failed to secure a sufficiently close view to determine the species. On 25th April, 1936, the butterfly was again in evidence and wandered down a border of daffodils apparently in search of food; it turned out to be a fairly good but rather faded specimen of *Vanessa atalanta* Linn., and the only damage I could see was that the left forewing was rubbed. I think the attraction was the scent of a cherry tree just coming into full bloom, but the record, which is the earliest date for the species that has fallen under my personal observation, rather suggests hibernation not far off the actual locus. W. Parkinson Curtis.

Honeycomb as a bait for moths.

Mr. H. L. Andrewes' interesting note, *ante* p. 141, has an error in it which Mr. T. Bainbrigge Fletcher, F.R.E.S., has been kind enough to point out, and as the error is due to a *lapsus calami* on my part I hasten to correct it. The plume mentioned should have been *Pterophorus monodactylus* Linn., and not *P. lithodactylus* Treits. W. Parkinson Curtis.

Eupithecia abbreviata Steph. (Lep.) feeding on Neottia nidus-avis Linn.

In 1916 I obtained a Geometrid larva feeding upon the flowers of the bird's nest orchis (*Neottia nidus-avis* Linn.) in Break Hill Wood, Canford, Dorset. I referred the larva to the genus *Eupithecia* correctly, but could make nothing of the species since it was a uniform orange-citrine in colour precisely like the flowers of the plant. The insect emerged on the 22nd April, 1917, and dissection has proved it to be a female of *Eupithecia abbreviata* Steph., rather dark, rather undersized, a little more mottled with white than is usual, but not sufficiently different from the *forma typica* to be classed as aberrational.

There are two odd things about this. The normal food-plant is oak, certainly but remotely related to the orchid, and *E. abbreviata* is not a general feeder; all the authorities I have consulted give oak as the only food-plant. Of course, the very young larva may have dropped from an oak tree and being unable to find its way back accepted this substitute; there was plenty of oak overhead. The other thing about it that strikes me as odd is that I know no member of the genus that feeds on plants that desire their food at second-hand from decaying vegetation as does *Neottia*, whose characteristic colour and appearance show it at once to be incapable of making its own carbohydrates; but *Eupithecia vulgata* Haw. will, according to

Mr. Prout, eat withered leaves. The bursa copulatrix is not quite normal, being rather poorly developed, but it leaves no doubt as to the true identity. W. Parkinson Curtis.

Cranefly and Earwig as the prey of the Blackbird.

On the 3rd June, 1936, in my garden at Bournemouth West, I observed a male blackbird (*Turdus Merula* Linn.) searching amongst a close growth of *Aster, Helenium, Solidago* and such-like perennials for food for the young in the nest. It emerged from the herbage within a foot or two of me with more than one large cranefly (*Tipula* sp.) in its bill, which it took to the nest, returning in a few moments to continue the search for prey. The preceding evening the same bird had accompanied me whilst I was working amongst the tall growth of these plants, and had industriously collected all the earwigs (*Forficula* sp.) which I had disturbed during my labours. This, with the other notes published by Mr. C. L. Collenette and myself recently, go far to show that the blackbird, which is popularly supposed to confine itself to slugs, earthworms and the like, is definitely inimical to adult insects. W. Parkinson Curtis.

Melolontha vulgaris L. (Col.) as the prey of the Sparrow.

On the 14th June, 1936, in my garden at Bournemouth, I observed a male sparrow (*Passer domesticus* Linn.) emerge from the same close growth as that referred to above with a cock-chafer in its bill. This it placed on a hard gravel drive, then seized a leg and hammered the insect on the ground; when detached, the leg was swallowed. When the supply of legs ran short the insect was seized by the head, and that was detached and swallowed. The absence of the head seemed to enable the bird to get a better grip, for it succeeded in holding the insect more firmly, and by steady hammering detached the elytra, which were rejected. It then succeeded in partially eviscerating the abdomen, but at this stage another sparrow arrived, and the evident interest of the newcomer in the prey caused the captor to retire to cover with the residue of the insect so that I was unable to watch the final fate of the insect. The time I had the bird under observation was ten minutes.

The behaviour of the sparrow was precisely similar to that of a thrush with a snail, but I was surprised to find such a comparatively heavily armoured insect was regarded as prey by a bird like a sparrow. It was quite evident that the sparrow had had previous experience with a Coleopteron of some kind, as it rejected without the smallest hesitation the detached elytra, which are, of course, devoid of any kind of soft material.

W. Parkinson Curtis.

Formicidae (Hym.) of the New Forest.

The following species of ants were collected in the New Forest between 20th and 27th April, 1935. A few species which were not found are also recorded to complete the locality list.

Ponera coarctata Latr.: Not found. Recorded by A. H. Hamm (no available reference) in 1908, when a female was caught on the wing.

Formicoxenus nitidulus Nyl.: First taken by G. R. Waterhouse (1858, *Proc. Ent. Soc. Lond.* (n.s.), **4** (1857): 89). With *Formica rufa* at Mark Ash.

Anergates atrulatus Schenck.: With *Tetramorium caespitum* by railway cutting, Beaulieu Road Station.

Myrmica laevinodis Nyl.: Common.

M. laevinodis Nyl. var. *ruginodo-laevinodis* Forel: Not found. Recorded by H. St. J. K. Donisthorpe (no available reference).

M. ruginodis Nyl.: Common.

M. sulcinodis Nyl.: Matley Passage, Hurst Hill Enclosure.

M. scabrinodis Nyl.: Matley Bog, in sphagnum.

M. scabrinodis Nyl. var. *sabuleti* Meinert.: Not found. Recorded by Donisthorpe (1913, *Ent. Rec.*, **25**: 45-46, 62) on 18th July, 1913, at foot of a post.

M. lobicornis Nyl.: Matley Passage. See 1908, *Trans. Leicester Lit. Phil. Soc.*, **12**: 228.

Stenamma westwoodi West.: Ashurst.

Leptothorax acervorum F.: Ramnor. See F. Smith (1855, *Trans. Ent. Soc. Lond.* (n.s.), **3**: 124-125).

L. tuberum F.: Near Ringwood. See *Myrmica unifasciata* F. Smith (1855, *Trans. Ent. Soc. Lond.* (n.s.), **3**: 128-129).

L. interruptus Schen.: Beaulieu Road Station cutting in sandy patch with fir-trees. Sometimes with *T. caespitum*. See *Leptothorax tubero-affinis* (*teste* Forel), Donisthorpe (1912, *Ent. Rec.*, **24**: 306).

Tetramorium caespitum L.: Beaulieu Road Hotel garden, and railway cutting. Common in that area. See Donisthorpe (1912, *Ent. Rec.*, **24**: 5-6).

T. caespitum L. var. *hammi* Donis.: Not found. Taken by A. H. Hamm on 25th August, 1912. See Donisthorpe (1915, Brit. Ants, 1st Edn.: 178).

Tapinoma erraticum Latr.: Lyndhurst — Beaulieu Road, in mounds of grass. See Donisthorpe (1908, *Trans. Leicester Lit.-Phil. Soc.*, **12**: 225).

Acanthomyops fuliginosus Latr.: Common.

A. niger L.: Abundant.

A. alienus Först.: In sandy banks round Lyndhurst.

A. flavus F.: Abundant.

A. mixtus Nyl.: In clearing near Beaulieu. See Donisthorpe (1919, *Ent. Rec.*, **31**: 4-5).

Formica rufa L.: Pound Hill Enclosure, Ramnor Enclosure, Mark Ash, as well as in parts where there are fir-trees.

F. exsecta Nyl.: Beaulieu Road, in banks. See R. C. Bradley (1897, *Ent. Mon. Mag.*, **33**: 46).

F. sanguinea Latr.: Beaulieu Road, Manor Wood, in sandy banks. See F. Smith (1858, Cat. Brit. Foss. Hym.: 6-7).

F. fusca L.: Fairly common.

F. fusca L. var. *glebaria* Nyl.: Beaulieu Road, Matley Bog, in sphagnum. See C. Crawley (1911, *Ent. Rec.*, **23**: 96).

F. fusca L. var. *rubescens* Forel: Not found, although it generally occurs in mounds, and has been recorded on numerous occasions by Donisthorpe (1913, *Ent. Rec.*, **25**: 66).

F. picea Nyl.: Matley Bog; always in the same locality, but varying in the number of nests according to the moist condition of the bog. In some parts they were most numerous in the swampiest areas. See *Formica fusca* race *gagates* (G. Arnold, 1905, *Ent. Mon. Mag.*, **41**: 211-212).

A. Norman Brangham.

A note on some parasites of Zygaena (Lep.).

A colony of *Zygaena* occupying a considerable area on top of the cliffs at Mawgan Porth, North Cornwall, provided some interest during a visit to the Bedruthan Steps Hotel from the 2nd to 19th August, 1933. Part of the colony was on the edge of the cliff in front of the hotel, and another part on the cliff across the inlet. At the time of the visit the greater number of the moths had emerged, but some were still coming out: all seen and bred were *Z. filipendulae* L. A very few cocoons were distinguishable by the yellow skin of the pupa protruding through the end, which offered a striking contrast to the normal black skin of *filipendulae*. My wife assisted in collecting as many cocoons as we could, some of which appeared to be relics of the previous summer. An attempt is made in this note to distinguish between cocoons which seemed to have been torn open by some predator (possibly earwigs, which were often found inside old cocoons, though they may only have been sheltering); those apparently bitten into by ants, which have a stained and minutely irregular margin to the hole, suggesting that body fluids have exuded from the pupa, and the small, clean hole left by emergence of a Hymenopterous parasite. But there is in the Hope Department a Zygaenid cocoon showing a similar irregular opening with the edges not stained. Dr. B. M. Hobby, who found this at Christchurch, Hants, August, 1927, saw a Pentatomid larva actually sucking the pupa, so that it is possible that a small, irregular hole may be due to various agents. A 'torn'

cocoon is of course not to be confused with one showing the normal exit hole at the upper extremity; the 'tear' may be no larger than would have been left by the emergence of a Tachinid parasite, or it may be large and irregular so that more than half of the cocoon has been damaged or removed. The following are the groups to which the cocoons, of whatever age, were assigned:

1.	Intact, with apparently living pupae (exclusive of group 6c)	76
2A.	Normal emergence, with pupal skin *in situ,* including 1 also 'torn'	222
B.	Ditto, but skin missing, including 21 also 'torn'	395
3.	Pupa dead inside cocoon	24
4.	Cocoon 'torn,' no remains of pupa	157
5.	Pupa apparently destroyed by ants (stained edge to irregular hole)	35
6A.	Pupa apparently destroyed by Hymenopterous parasite (small clean hole)	9
B.	As A, but cocoon also 'torn'	4
C.	Cocoons from which parasites were reared ...	23
D.	Cocoons with parasitic cocoons on the exterior	3
7A.	Pupa Tachinised (cocoon either contained Tachinid pupae or showed exit of Tachinid)	5
B.	Cocoon showing exit hole of Tachinid, but also apparently bitten by ants	1
	Total cocoons examined	954

Out of the total of 954 examined, 617 apparently produced imagines, and 76 contained apparently healthy living pupae: 261 for one reason or another failed to produce imagines. The parasites that emerged from these cocoons between 15th August and 5th September were identified by Messrs. J. E. Collin and J. F. Perkins, to whom the writer is greatly obliged. The specimens are at Oxford, in the Hope Department of Entomology of the University Museum, except for representatives given to the National Collection.

DIPTERA. TACHINIDAE.

Tachina larvarum Linn. 1.

HYMENOPTERA. ICHNEUMONIDAE.

Gambrus ornatulus Thoms. 2 ♂♂, 9 ♀♀.

On this species Mr. Perkins kindly reported: 'There is no material of *G. ornatulus* in the British Museum and the species has not previously been recorded from Britain. Morley, however, refers to a species "*? ornatus* Grav." that was bred from *Zygaena,* and very probably was this species: it is extremely close to *G. ornatus* Grav.'

Spilocryptus abbreviatus F. 2 ♀♀. Typical form.

This is not mentioned by C. Morley and W. Rait-Smith (1933, *Trans. R. ent. Soc. Lond.*, **81**: 138) in the list of parasites of *Zygaena*.

Apanteles sp., hyperparasitised by an undetermined species of *Gelis*. 4 ♂♂, 7 ♀♀ from one host larva.

It will be of interest to add here a note from Mr. Perkins on parasites from *Zygaena lonicerae* Esp. and *filipendulae* from various British localities reared by Mr. H. R. Hewer in 1929-30. 'From Hewer I only got *Mesostenus subovalis* Thoms. and *Casinaria orbitalis* Grav. as primary parasites and a batch of hatched cocoons of *Apanteles zygaenarum* Marsh., *Gelis* sp., a hyper-parasite of *Casinaria,* and *Mesochorus* sp. which may possibly be a hyperparasite of one of the Tachinids. But among your batch I found none of that species.' Mr. Hewer bred also two species of Tachinids, *Phryxe nemea* Mg. and *Eutachina fasciata* Fall. (det. D. Aubertin, 1933).

The second part of this note concerns specimens, also at Oxford, from Wood Fidley, New Forest, bred and presented in 1913 by the late F. C. Woodforde, with the following remarks: 'Three larvae seen circa July 15th emerging from the body of a *Zygaena meliloti* Esp. killed with ammonia on circa July 12th. They pupated in sand and flies emerged between August 4th and 19th.'

Dr. F. W. Edwards very kindly identified the flies as the Phorid *Megacelia* (*Aphiochaeta*) *rufipes* Mg., 2 ♂♂, 1 ♀. The presence of a Dipterous larva in the imago of a *Zygaena* was recorded by H. M. Edelsten (1934, *Proc. R. ent. Soc. Lond.*, **8**: 131), the specimen being a *Phryxe vulgaris* Fall. ♀, and the moth *Zygaena lonicerae* in Wood Walton Fen, Cambridgeshire.

G. D. Hale Carpenter
(*Hope Professor of Zoology* (*Entomology*) *in the University of Oxford*).

Escape of Butterfly after capture by Bird.

On 16th July, 1936, at Wolvercote, Oxon., a hedge sparrow was seen holding in its beak a living meadow brown (*Maniola jurtina* L.), which it was endeavouring to feed to a young cuckoo, slightly larger than itself. The butterfly, however, succeeded in breaking free before the cuckoo could seize it, and fell to the grass, whence it flew away after a few seconds.

J. Ford.

Anthicidae (Col.) new to Berks and Oxon.

Three examples of *Anthicus bifasciatus* Ross. were collected in haystack-refuse on 3rd November, 1935, on the Berkshire bank of the Thames at Godstow. This appears to be the first

Berkshire record for the species, which was previously found in the Oxford district by Mr. J. Collins at Water Eaton, and later by Commander J. J. Walker at Summertown (1936, *Rep. Ashmol. nat. Hist. Soc.*, **1935**: 15-16). A single specimen was again taken in a manure-heap near Waterperry, Oxfordshire, on 6th June, 1936.

Anthicus tobias Marsh., which was recently added to the British list, was found for the first time in Oxfordshire at Watlington, on a small ash-dump, on 20th June, 1936. Two specimens only were captured, after a lengthy search, under stones and pieces of tin lying about on the surface of the dump. Guichard (1936, *Ent. mon. Mag.*, **72**: 40) gives a resumé of the previous occurrences of *A. tobias* in England.

E. W. Aubrook.

Emergence of the parasitic Ichneumonid Orthopelma luteator Grav. from the gall of Rhodites rosae (L.).

The Cynipid gall, sent me by Miss C. K. Pearce, was found in 1935 on rose by Sidney Taylor in the garden of Churchen Green School, E. Morden, Wareham, Dorset. Many insects had already emerged and the following were recorded by me in 1936:—

May 15	- 1	*Orthopelma luteator*,	♀.	
,, 17	- 1	,,	♀.	The date is approximate.
,, 21	- 3	,,	2 ♀, 1 ♂.	
,, 23-4	- 2	,,	2 ♀; also 1 *Rhodites rosae*, ♀.	
,, 26	- 1	,,	♀.	
,, 27	- 1	,,	♀.	
,, 29	- 1	,,	♀.	
June 3	- 1	,,	♀.	
,, 5	- 1	,,	♀.	
,, 9	- 1	,,	♀.	
,, 14	- 1	,,	♀.	
	Total ...		13 ♀, 1 ♂	

Mr. J. F. Perkins, in kindly naming the specimen which emerged on 15th May, wrote: 'This parasite is frequently bred in greater numbers than the *Rhodites* from these galls'—a conclusion which is strongly confirmed by the above record of 13 females and 1 male of the Ichneumonid to a single female of the Cynipid. The parasite is placed by Morley in the Ichneumonidae-Cryptinae-Hemitilini. The perforations on the surface of the gall indicate 31 emergences—more than double the number in the above list. I have also to thank Mr. R. B. Benson and Dr. B. M. Hobby for kind help in preparing this brief record.

E. B. Poulton.

Bees and Conopidae (Dipt.).

Two interesting series of bees (*Halictus*) taken with their Dipterous (Conopid) mimics at Hunstanton, Norfolk, in September, 1900, and at Bembridge, Isle of Wight, in August, 1901, respectively, were mislaid, and when recently recovered, the name of the captor and donor could not be determined with certainty.* We felt confident, however, that the handwriting was that of an old friend Edward Saunders, an opinion confirmed by Dr. R. C. L. Perkins and finally settled by Mrs. M. A. Saunders, who kindly sent the diary which records the visit to Hunstanton, September 25th to October 2nd, 1900.

The specimens comprise a male and a female *Halictus morio* F. and two female *Oncomyia pusilla* Mg. on one mount, labelled in the MS. of Edward Saunders 'Hunstanton / same bank / Fly very similar / to Halictus in movement / 9.00.'

A second label in Saunders' MS. reads 'Halictus / nidiusculus ♂♀ / with Conops?', but this has certainly been misplaced as well as mis-spelt and should evidently refer to the two *H. nitidiusculus* mentioned below.

All the specimens from the Isle of Wight are mounted separately and labelled in Saunders' MS. 'Bemb./I.W./8.01.' They consist of a male *H. morio,* a male and a female *H. nitidiusculus* Kirb., three female *Oncomyia atra* F., and one male and one female *O. pusilla* Mg. The single example of *H. morio* bears a second label in Saunders' MS., 'H. morio/with Conops.'

We are much indebted to Mr. R. B. Benson and to Dr. F. W. Edwards for kindly confirming the identifications given above.

Dr. R. C. L. Perkins wrote (*in litt.,* 15.v.1935): 'Both *Oncomyia pusilla* Mg., and the one other very similar, but larger, species of the genus, *O. atra* F., I have collected and seen in many cases in connection with species of *Halictus*. The Conopids of the genus *Myopa* which are parasitic on *Andrena* I have seen follow a laden *Andrena* right to the burrow on various occasions, but the Andrenas are then provisioning their nest, which may already contain eggs or the pollen or larvae. The Oncomyias which are most common in autumn, when the Halicti are numerous, are in a different situation, since these Halicti are not then provisioning their nests, but the females are (after pairing) about to hibernate — the males dying before winter. The Oncomyias do not themselves hibernate, so that if really parasitic on *Halictus* I suppose they must pass the winter as eggs or first instar larvae. My idea in collecting a few specimens with the Halicti was that the forms of *Oncomyia* on different hosts might form distinct races or subspecies.'

B. M. Hobby & E. B. Poulton.

* Specimens in the Hope Department, Oxford University Museum.

Notes on the larvae and pupation of the Geometrid Moth Phorodesma smaragdaria F. (Lep.).

My kind friend Mr. Hugh Main, who has so often given me great pleasure by sending rare and interesting insects for study, wrote on 12th May, 1936, the following letter accompanying the hibernated larvae of *Phorodesma smaragdaria* which are the subject of these brief notes:—

'I found the larvae of the "Essex Emerald" last autumn in the Essex marshes, and they hibernated and recently started to feed again. They were on *Artemisia maritima,* which is abundant all along the banks of the various rivers on the Essex coast. I had put into the garden some plants of the garden *A. abrostanum* for them, but I found some time ago that they would eat *A. vulgaris*. The leaves of this species are, however, not so suitable for providing "coats." South also gives *A. absinthium*. I enclose a couple of sprays of *maritima* that should carry you over till you get another supply. The larvae spin up nicely among the leaves and stems of the *Artemisia*. The food-plant is apt to dry up rather readily unless kept in cages with a *slightly* damp atmosphere.'

Mr. Main also directed my attention to the papers on this species by the Rev. C. R. N. Burrows (1900, *Ent. Rec.,* **12**: 113-5, 152-4, 169-71 (Pl. VII), 171-2), who himself refers to the paper by G. Elisha (1886, *Trans. Ent. Soc. Lond.,* **188**: 465-8).

The supply of *A. maritima* L., which arrived with the larvae, lasted well in glass, white-muslin-topped, cylinders resting on plates drilled for the stalks to pass through into water beneath. The following species of *Artemisia* are mentioned by Mr. Hugh Main as among the plants eaten by these caterpillars: *abrostanum* L. (Southern Wood, Old Man), *absinthium* L. (Wormwood), *vulgaris* L. (Mugwort), and in addition *Tanacetum vulgare* L. (Tansy) has been found acceptable. My larvae, however, did not appear to thrive on these species after their earlier stages on *A. maritima,* and when a second supply of this plant, kindly sent by Mr. Main, was nearly exhausted, I began to feel anxious until Mrs. Moullin, the Secretary of Oxford University Botanical Dept., kindly sent an ample amount of *A. mutellina,* which is growing in the Botanic Gardens. The result was so satisfactory that I think entomologists will be glad to know more about this food-plant. Prof. A. G. Tansley, F.R.S., has kindly written the following account of it:—

'12th June, 1936—*Artemisia mutellina* Villars is apparently properly called *Artemisia laxa* (Lamarck) Fritsch. It is an alpine plant, known to the German-speaking people as "Edelraute," and is said to be so much prized and sought after that it has become rare in many parts of the Alps, especially in the Austrian Mountains. It is used as a tonic, febrifuge, etc., and also

decoratively.'

The wonderfully procryptic effect of the fragments of food-plant attached to the larvae gave very great pleasure to me and to the many friends who saw the caterpillars, and I thought that a careful study of the mode of attachment, investigated with the help of modern instruments, would be extremely interesting. I therefore asked my friend Dr. B. M. Hobby if he would undertake this work. He consented and has written the illustrated statement which follows these notes upon the four larvae and especially upon the behaviour of two of them prior to pupation.

Larva 1 appeared to be mature on June 9th and was taken to the Hope Dept. for Dr. Hobby to study. It was brought back on the same day and in about twenty-four hours had spun a cocoon on the muslin cover. On June 15th, about 10.0 a.m., I observed that the larva had bitten a hole in the cocoon and that about half its length was hanging free. A little later it had fallen a distance about 4 ins. on to the plate and at about noon I carried it to the Dept. for Dr. Hobby to draw. When, however, he arrived on June 16th to finish the work, pupation had occurred and the chrysalis had already darkened to the permanent shade of brown. A male emerged June 28th-29th.

Larva 2 began to spin on June 12th and, unlike any of the others, gnawed a hole in the muslin cover. When this was taken off and replaced the disturbed larva returned to the hole in a few minutes and again gnawed the muslin. Although feeding had ceased the larva continued to pass faeces from time to time, three being removed about 5.30 p.m., one later the same evening, two on the morning of June 13th and one (the last) at 4.15 p.m. On the morning of June 13th the larva had abandoned the hole and was apparently spinning at another part of the muslin. On June 14th it was certainly spinning at the same spot as on the day before. On June 16th the cocoon was taken to the Dept., cut open about 3.15 p.m., and the larva removed in order to be studied and drawn. At 3.30 p.m. on June 17th it pupated while Dr. Hobby was at work on the drawing. A female emerged June 28th-29th.

Larva 3 pupated June 11th-12th, the chrysalis being exposed and free from any covering. A female emerged on June 25th.

Larva 4 also produced an exposed pupa June 11th-12th. A male emerged on June 26th.

The behaviour of the larvae suggests a possible transition from pupation in a cocoon attached to the food-plant to a final ecdysis on the ground where the pupa would be hidden among vegetable débris. It must be remembered that the larvae were healthy and produced normal moths, two of each sex.

E. B. Poulton.

Notes on the larva of Phorodesma smaragdaria F. (Lep.).

The description of the larva of *Phorodesma smaragdaria* given by Burrows (1900, *Ent. Rec.*, **12**: 169-70, Pl. VII) is very complete and there is little to be added. The larva is of the usual Geometrid type, but has a rough skin, a pattern of longitudinal stripes and well-developed setae; the large dark spiracles are arranged along a sigmoid curve (Fig. 14: 1). Fragments of the food-plant are attached to special tubercles found on the 1st, 2nd, 3rd, 4th, 5th and 8th abdominal segments by means

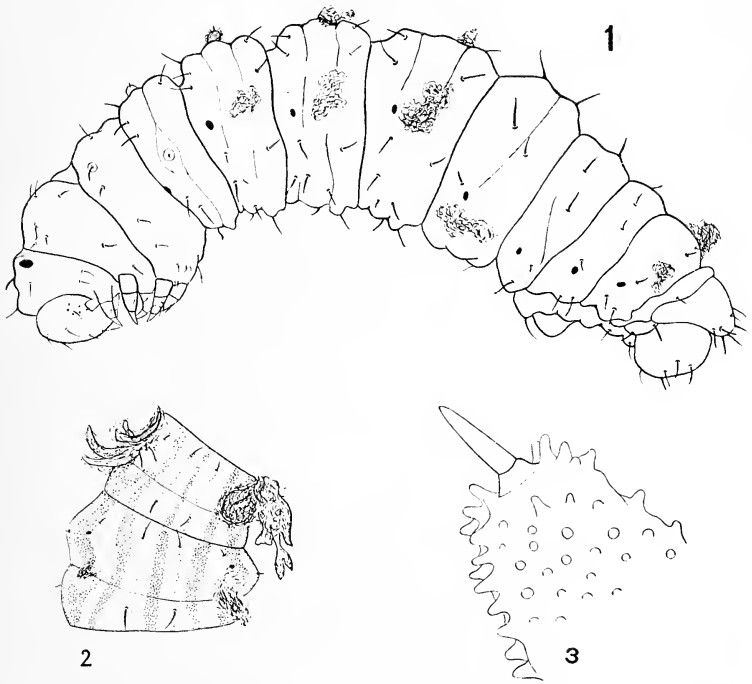


Fig. 14. 1.—*Phorodesma smaragdaria* F. Lateral view of larva, showing special tubercles of 1st, 2nd, 3rd, 4th, 5th and 8th abdominal segments, all except the first covered with silk. 2.—Dorsal view of larva, showing 2nd and 3rd abdominal segments with special tubercles covered with silk and fragments of the foodplant. 3.—Lateral view of special tubercle.

of silken threads spun by the larva (Fig. 14: 2). Each tubercle (Fig. 14: 3) is a conical fleshy process with a stout terminal spine and numerous small projections all over the surface. All are subdorsal in position except that of the 5th abdominal segment, which is placed low down at the side of the segment below and behind the spiracle. The tubercles are admirably adapted to

give a firm hold to the silken fibres and usually retain them even when the larva is deprived of its covering of leafy fragments.

B. M. Hobby.

Parasitic Hymenoptera bred from British Lepidoptera-Heterocera by H. C. Hayward, M.A., F.R.E.S.

The following list of parasites of British moths should be compared with Mr. Hayward's earlier breeding records published (1933, *J. Ent. Soc. S. Engl.*, **1** (3): 53-55) by Sir Edward Poulton, to whom I am indebted for the privilege of studying the material. As in the account of Mr. Hayward's previous observations, the names of the hosts, localities, the stage of the host (whether larva or pupa) from which the parasite emerged, with the month and year of emergence are usually given. For determination of the parasites I am indebted to Dr. C. Ferrière and Mr. F. J. Perkins, these authorities being indicated in the table by the bracketed initials of their surnames.

In view of our scanty knowledge concerning the parasites of even the commonest species, it is to be hoped that Lepidopterists and others will carefully preserve and label all specimens they may have the good fortune to breed and take suitable steps to have their observations properly recorded. I may add that all the above-mentioned material is incorporated in the bionomic collections of the Hope Department of Entomology, Oxford University Museum, and that the gift of further specimens would be very much appreciated.

Parasite.	Host and stage (when recorded).	Locality and date of emergence (when recorded).
BRACONIDAE. MACROCENTRINAE.	LEPIDOPTERA.	
Macrocentrus abdominator F., 3 ♀♀ (P.).	*Cacoecia podana* Scop., larva (TORTRICIDAE).	? Locality : vi.1933.
ICHNEUMONIDAE.		
(*a*) CRYPTINAE.		
Hemiteles bicolorinus Gr., 1 ♀ (P.).	?*Borkhausenia fuscescens* Haw. (OECOPHORIDAE).	? Locality : vii.1933.
Hemiteles sp., 1 ♀ (P.).	?*Peronea hastiana* L. or *P. logiana* Schiff. (TORTRICIDAE).	S. Dorset : ix.1933.
(*b*) ICHNEUMONINAE.		
Platylabus pedatorius F. var. *iridipennis* Wesm., 4 ♂♂ (F.).	*Eupithecia albipunctata* F., pupa (HYDRIOMENIDAE).	Repton, Derbyshire : iii.1933.
do., 15 ♂♂, 8 ♀♀ (F.).	do.	do. : iv.1933.
do., 2 ♂♂, 1 ♀ (F.).	do.	do. : v.1933.
Platylabus pedatorius F. var. with red abdomen, 1 ♂ (F.).	do.	do. : v.1933.

Parasite.	Host and stage (when recorded).	Locality and date of emergence (when recorded).
(*c*) OPHIONINAE.		
Angitia sp., 1 ♂ (F.).	*Peronea hastiana* L., larva (TORTRICIDAE).	Swanage : ix.1933.
do., I ♂ (F.).	do.	S. Dorset : viii.1933.
do., 1 ♀ (F.).	*Fumea casta* Pall. (PSYCHIDAE).	Hants : vi.1933.
Blaptocampus nigricornis Wesm., 1 ♀ (P.).	*Hydriomena nigrofasciaria* Göze, pupa (HYDRIOMENIDAE).	Kent : 1933.
Omorgus mutabitilis Hlg., 1 ♂, 2 ♀♀ (F.).	*Endothenia gentianana* Hübn., larva (EUCOSMIDAE).	S. Dorset : iv.1933.†
Trichomma minuta Brm., 1 ♀.	*Peronea hastiana* L., pupa (TORTRICIDAE).	Studland, Dorset : 8.x.1933.
do., 2 ♂♂ (P.).	do.	do. : x.1933
(*d*) PIMPLINAE.		
Glypta sp., 1 ♂ (F.).	?*Eucosma cana* Haw. (EUCOSMIDAE). or *Phalonia badiana* Haw. (PHALONIADAE).	Kent : vii.1933.*
Itoplectis sp.? *alternans* Gr., 1 ♂ (P.).	*Peronea logiana* Schiff. pupa (TORTRICIDAE).	S. Dorset : ix.1933.
Phytodictus sp., 1 ♂ (P.).	*Peronea hastiana* L., larva (TORTRICIDAE).	Swanage, Dorset : ix.1933.
do., 2 ♀♀, 1 sex indet. (P.).	do.	Studland, Dorset : x.1933.
(*e*) TRYPHONINAE.		
Exochus sp.? *tibialis* Holmgr., 1 ♂.	do.	E. Dorset : 3.x.1933.
do., 1 ♂.	do.	do. : 9.ix.1933.
do., 1 ♂ (P.).	do.	Swanage : 9.ix.1933.
Tricistus curvator (F.) Grav., 1 ♀ (F.).	*Eupithecia trisignaria* Herr.-Schäff., pupa (HYDRIOMENIDAE).	Derbyshire : 10.vii.1933.

* Bred from heads of burdock. † Bred from teasel.

B. M. Hobby.

Andrena marginata Fabr. (=cetii Sehr.) (Hym.) in Oxfordshire.

A number of this local species were taken on *Scabiosa* on the downs at Watlington on the 18th Aug., 1936. The specimens show considerable variation in colour, some being almost wholly yellow, others with a marked amount of infuscation.

F. J. Killington.

Spiral segmentation in the immature stages of Hipocrita jacobaeae L. (Lep., Arctiidae).

Amongst a number of larvae of *Hipocrita jacobaeae* L. collected *en masse* at Cumnor Hill, near Oxford, by Prof. G. D. Hale Carpenter in July, 1936, and given to me to breed, was a single example exhibiting spiral segmentation.

The fourth and fifth abdominal segments are affected, as in the larva of the same species described by Cockayne (1929). Ventrally the larva is quite normal, the black bands of all segments being parallel, and prolegs being present on abdominal segments 3, 4, 5 and 6. Dorsally, the epidermis has the appearance of being strongly twisted. There is an oblique black band of normal width, formed of the left half of the fourth and the right half of the fifth bands. The spiral is complete; the right half of the fourth band narrows as it unites with the third, and the left half of the fifth similarly fuses with the sixth (Fig. 15c).

Pupation took place on 25th July; the pupa was of normal size and showed the same abnormality.

The abdominal segments of the pupa are displaced to the left of the longitudinal axis (Fig. 15A). The hind margin of the third abdominal segment is recurved shortly on the right of the mediodorsal line, and is at once terminated; thus a compound segment is formed by the fusion of the third segment with the right half of the fourth. There is a short, curved impression sinistrad to the mediodorsal line of this segment.

In a normal pupa the spiracles are in a straight line, but in the aberrant example here described the spiracles of the fifth and following segments are displaced ventrally and dorsally on the left and right respectively, so that curved lines are produced (Fig. 15B).

Figures of two pupae of the Arctiid moth *Apantesis nais* (Dru.) showing left- and right-handed spiral segmentation are given by Learned (1932), who discusses the cause and origin of segmental abnormality.

I wish to thank Prof. Carpenter for the opportunity of making this description.

References.

Cockayne, E. A. 1929. Spiral and other anomalous forms of segmentation. *Trans. ent. Soc. Lond.*, **1929**: 177-84.

———— 1934. Spiral and other anomalous forms of segmentation, with an account of three ventral spirals in one brood of *Hadena dissimilis* Km. *Trans. R. ent. Soc. Lond.*, **1934**: 165-72.

Hawkins, C. N. 1933. Abnormal larvae of *Amathes* (*Orthosia*) *macilenta*, Hb. (Lep.). *Trans. R. ent. Soc. Lond.*, **81**: 223-29.

Learned, E. T. 1932. An occurrence of spiral segmentation in *Apantesis nais* (Lep., Arct.). *J.N.Y. ent. Soc.*, **40**: 167-80.

E. W. Aubrook

(*Dept. of Entomology, University Museum, Oxford*).

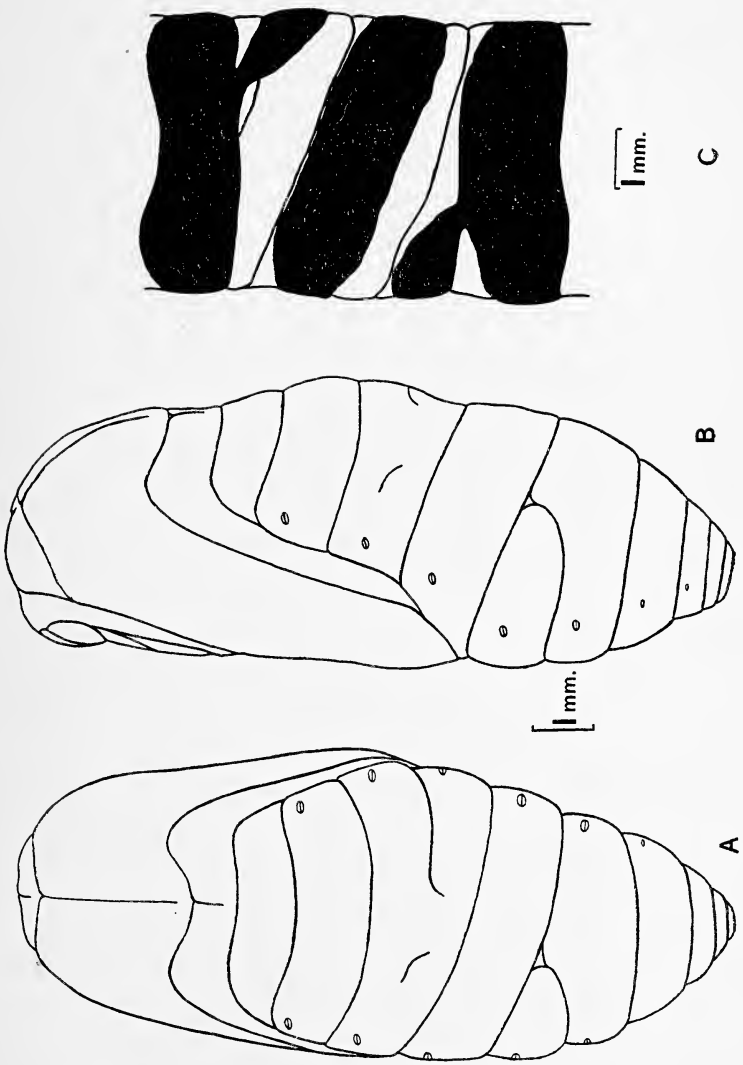


FIG. 15.—Spiral segmentation in *Hipocrita jacobaeae* L.
A—pupa, dorsal view. B—pupa, lateral view. C—larva, third to sixth abdominal segments, dorsal view.

Conops strigatus Wied. and other Conopidae (Dipt.) in the south of England, 1936.

In view of the fact that the distribution of these interesting flies is not well known, the following records may be of some value:—

Physocephala rufipes Fabr.—On *Scabiosa* at Watlington, Oxfordshire, both sexes, 18th Aug. On *Rubus fruticosus* Linn., at Westend, Hampshire, one male, 27th Aug.

Conops ceriaeformis Mg.—On *Mentha aquatica* Linn., many males and one female at Cothill, Berkshire, 21st Aug. On *Origanum vulgare* Linn., males, at Watlington, 18th Aug. On *Eupatorium cannabinum* Linn. and *Mentha aquatica* Linn., many males and one female, at Cothill, Berkshire, 21st Aug. On *Hieracium* sp., one female, at Bishopstoke, Hampshire, 26th Aug. On *Carduus arvensis* Curt., both sexes in numbers, at Westend, 27th Aug.

Conops flavipes Linn.—On *Mentha aquatica* Linn. and *Senecio aquaticus* Huds., males, at Cothill, 21st Aug. On *Carduus arvensis* Curt., males, at Westend, 27th Aug.

Conops quadrifasciatus De G.—On *Origanum vulgare* Linn., at Watlington, 18th Aug. On *Mentha aquatica* Linn., males, at Cothill, 21st Aug. On *Senecio Jacobaea* Linn., males, at Bishopstoke, 26th Aug. On *Carduus arvensis* Curt., males and females, at Westend, 27th Aug.

Conops strigatus Wied.—One male of this rare species swept from grass, at Watlington, 18th Aug.

Myopa buccata Linn.—On *Euphorbia amygdaloides* Linn., both sexes, at Bishopstoke, 23rd May.

Sicus ferrugineus Linn.—On *Mentha aquatica* Linn., both sexes, at Cothill, 21st Aug. F. J. Killington.

Limenitis camilla Linn., ab. nigrina Weym. (Lep.).

The following notes on this species are interesting as showing the probable influence of heredity upon variation.

In July, 1928, a specimen of the ab. *nigrina* Weym. was taken by Mr. Eustace, of Wellington College, in a wood in the Reading district. Subsequently another similar specimen was seen and missed by Mr. Clifford Wells, of Wellington College. In this wood the *camilla* are practically confined to one part where the bramble blossom is in evidence, and in the following year I collected about eighteen larvae from honeysuckle. The pupae resulting from these larvae all clearly showed the white markings on the wings, before emergence, with the exception of one, which was entirely black. This I fully expected to produce an example of the ab. *nigrina,* but unfortunately it died in the pupa case. A careful examination of the unexpanded wings

showed no trace of white, and I feel assured that had the butterfly successfully emerged it would have been of the *nigrina* form.

In July, 1933, Mr. Clifford Wells, whilst collecting with me in the New Forest, caught a male example of ab. *nigrina*. In the following year I took from honeysuckle growing close to the place where Mr. Wells took the butterfly, some two dozen larvae. All these duly pupated, and three of the pupae failed to show any sign of white markings on the wings as clearly indicated on the rest of the pupae. These three pupae ultimately produced imagines of the *nigrina* form, but unfortunately all were too crippled to be set. The remaining pupae produced perfect imagines of normal type.

It would almost seem that this melanic form of *L. camilla* is peculiarly liable to crippling or disease, and this may be a reason why so few butterflies of the *nigrina* form are seen on the wing in seasons when the insect is particularly abundant. Every year specimens are taken in several widely separated localities, and in certain years they have occurred in some comparative plenty.

S. G. Castle Russell.

Sziladynus luridus Fall. (Dipt., Tabanidae) taken in England and a further English locality for Sziladynus montanus Meig.

On 2nd June, 1934, my friend Mr. C. H. Wallace Pugh of Oswestry was collecting Diptera at Whixall Moss, Salop, when he captured a male Tabanid which appeared to be *Sziladynus luridus* Fall. (=*Therioplectes luridus* Verrall).

When paying me a visit early in 1935 Mr. Pugh brought this specimen with him, and on learning that it had not hitherto been recorded in Britain south of Scotland he very kindly gave me the specimen.

As it was so unusual for a new Tabanid to be found in the male sex only, I asked Mr. Pugh to do his best to secure females. Mr. Pugh's visits to the locality were on cold days, and were not successful, but his friend Mr. T. Hignett secured two females, one on 17th June, 1936, and the other on 4th July, 1936. I have seen these specimens and there is no doubt of their identity. Mr. Pugh is to be congratulated on a most interesting capture.

S. luridus Fall. is not uncommon in the Scottish Highlands, and may be found in a number of localities in and around Aviemore, Inv., in June. It is usually accompanied there (or rather followed) by *S. montanus* Meig., which in July is usually abundant there; it is, therefore, interesting to note that Mr. Pugh and Mr. Hignett have also taken *S. montanus* at Whixall Moss, the dates ranging from 2nd July (in 1932) to 15th August (in 1936).

E. Rivenhall Goffe.

Laspeyresia conicolana Heylaerts (Lep.) in Hants and Dorset.

This Tortricid was first discovered in the British Isles by Mr. Fassnidge, who found it flying around *Pinus sylvestris* L. in the New Forest (Huggins, 1931, *Entomologist,* **64**: 27).

During April, 1935, I gathered a number of cones of Scotch Fir which had been mined apparently by *Dioryctria abietella* Fabr. from Holmsley in the New Forest. I subsequently bred a few *L. conicolana* Heylaerts.

In the autumn of that year I gathered a good many fresh cones from another part of the Forest and also from Canford Heath in Dorset. In May, 1936, I bred a few *L. conicolana* Heylaerts from both localities. I believe that this is the first record for the occurrence of this species in Dorset.

The presence of *L. conicolana* Heylaerts in any given locality is easily ascertained by examining the fallen cones of *Pinus sylvestris* L. Small holes towards the extremity of the bracts show the emergence holes of the pupae.

S. C. Scarsdale Brown.

Crambus salinellus Tutt (Lep., Pyralidina) in Dorset.

As this species is always very local and uncommon, the following record of its occurrence on the Dorset coast may be of interest.

At 3 a.m. on the 10th August, 1935, I turned the headlights of my car on to a part of the Chesil beach that lies between the Weymouth—Portland road and the sea. In about an hour I had taken nine fresh specimens. It is probable that this species occurs in suitable places all along the Chesil bank, as W. Parkinson Curtis and myself took one at light about two miles west of Abbotsbury on the 3rd August, 1935. The distance between these two localities is eleven miles.

A visit to the Weymouth locality at dusk on 18th August, 1936, failed to produce this species. Possibly it was over by this date, but judging from the late hour during which the previous year's captures were made it may be that *salinellus,* unlike the rest of the species in the genus *Crambus,* is a late flier. If this is so it may account for its apparent scarcity.

S. C. Scarsdale Brown.

Occurrence of Cateremna terebrella Zinck (Lep.) in Dorset.

In the late autumn of 1935 I gathered a number of aborted cones of *Picea excelsa* Link. which had been lying on the ground beneath the trees for some months. In May and June, 1936, I bred a few specimens of *C. terebrella* Zinck. The cones were gathered from two localities in East Dorset. I believe this to be the first record for this species in Dorset.

S. C. Scarsdale Brown.

Occurrence of Plusia moneta Fabr. and Aegeria tipuliformis Clerck (Lep.) in Scotland.

During the last week of July, 1936, Mr. P. Harwood took several specimens of *Plusia moneta* Fabr. and one specimen of *Aegeria tipuliformis* Clerck in a garden at Aviemore, Inverness-shire. The food-plant of both species was growing nearby. Meyrick (1927, A Revised Handbook of British Lepidoptera) gives Cheshire as the most northerly county for *moneta* Fabr. and Argyllshire for *tipuliformis* Clerck.

S. C. Scarsdale Brown.

Platyptilia pallidactyla Haw. (Lep., Pyralidina) in Scotland.

While collecting Lepidoptera at Aviemore, Inverness-shire, in the last week of July, 1936, I took a worn Pterophorid. Mr. W. Fassnidge has identified it as *pallidactyla* Haw.

Meyrick (A Revised Handbook of British Lepidoptera, 1927, p. 453) gives for its distribution England and Ireland, hence this is the first record, as far as I am aware, of its occurrence in Scotland. S. C. Scarsdale Brown.

Sphinx pinastri L. (Lep.) in Bournemouth.

Between the middle of July and middle of August, large numbers of *S. pinastri* were observed resting on the trunks of pine trees in the neighbourhood of Bournemouth, some being found quite near the town itself, in the Municipal Gardens. The species was so common that fifty or more could have been secured had one so desired, although I contented myself with some fifteen specimens collected for myself and friends.

Specimens were invariably resting on the north-west side of the tree trunks and, in almost every case, not more than four feet from ground-level. Two specimens were seen at about ten feet from the ground. Two pairs found *in cop.* on the trunks laid a large number of ova, and from these larvae were hatched which were bred into the final instar. Unfortunately, at this stage and only a week off pupation, an epidemic of acute diarrhoea set in and the whole of them perished within five days, and that in spite of segregating those not at first attacked. Dr. Haines bred three successfully from ova obtained from a specimen found on a pine trunk at Linwood, and one of these in the final instar turned brown, a form which I believe has not yet been reported. The change of colour appeared at the ecdysis and was not the final change observed immediately before pupation.

The green and white striped scheme of the 2nd to 4th instars is worth noticing, as when the larva was extended along a branch, surrounded by pine needles, it was practically invisible,

and specimens were again and again overlooked when discarding the stale food. A second examination of this latter almost always found two or more larvae which had escaped notice.

It is in strong contrast to the final stage, where the larvae is now too large to be effectively concealed and has to take on more aggressive colours to defend itself from the attacks of birds. Thus only can we explain the abrupt change to reddish along the dorsum.

The ovum when first deposited is palest yellow, but on the second day becomes golden-brown on the upper pole. Hatching takes place on the tenth day. The bifid end of the tail spine should be noted and this is found in the first four instars, growing progressively less marked. The larvae were fed on *Pinus sylvestris* L., the trees on which the imago was found.

F. C. Fraser.

The occurrence of Salebria obductella F.R. (Lep. Pyralidae) in Britain.

The history of this species in Britain may conveniently be found summarised in 1929, *Entomologist,* **62**: 34, 52-3, 193-5, where Mr. H. C. Huggins describes the life-history of the species as he observed it in East Kent. Now that the locality where he discovered it has been destroyed for the species by being turned into a scarifying ground for chicken, it may be of interest to record two more recent discoveries of this insect in different parts of Kent where it is still flourishing.

It was on 11th August, 1932, that I first saw this insect alive, although I did not then know what it was. Three specimens were disturbed from a clump of marjoram on the chalk downs near Wye in mid-Kent. The next year I was unable to get to the spot, but in 1934 I flushed a further specimen from the same clump, and last year, when my specimens had been identified by Mr. Higgins, I had a good look round and found the species still happily flourishing, but apparently restricted to one small area where the marjoram grew thick and rank beneath a bush. I am extremely doubtful whether the species would ever have reached this inland spot by immigration from abroad, having in view its extremely sluggish habits.

Secondly, while I was collecting some four miles west of Dover (perhaps the spot where Sydney Webb took his specimen in 1888), Dr. H. J. R. Twigg, who was with me, kicked up a specimen. Further search revealed a clump of marjoram, where the species appeared to be breeding in numbers. Over a dozen specimens were kicked up within ten minutes, all the time we had at our disposal. Some of these had clearly, to judge by their freshness, only emerged that afternoon.

These two records, coupled with those of Mr. Higgins and Mr. Daltry, give me to suppose that the insect might well occur at many places along the North Downs, were the trouble taken to search for it: in both cases, my discoveries were made entirely by chance, and I have never searched for the species elsewhere: when time allows I hope to do so. A. J. L. Bowes.

Epischnia banksiella Rich. and Nephopteryx genistella Dup. (Lep.) at Hayling Is.

In respect of the reference to the above in Mr. Parkinson Curtis's article (1936, *J. Soc. Brit. Ent.*, **1**: 168-169) it may be of interest to record the capture of two specimens of *Epischnia banksiella* Rich. on 16th and 20th August, 1922, at sugar on marram grass on the sandhills of Hayling Island. The food-plant, golden samphire, was entirely absent on this side of the Island, though on the north side, some two or more miles distant, it is plentiful, but here we were unable to find it in spite of careful search for the larva.

Pending investigation, I placed the specimens with *E. elutella*, but when my friend, the late Mr. A. F. Griffith, acquired them at the sale of my collection he sent them to Mr. Meyrick for confirmation, as they were more strongly marked than the Portland form. They are now in Mr. Griffith's collection in the Cardiff Museum.

I found the larvae of *N. genistella* in plenty on *Ulex* quite close to the sandhills on which *E. banksiella* occurred and bred a fine series which are also in the Cardiff Museum.

John E. Eastwood.

A Note on some Hymenoptera and Diptera bred from a dead cricket bat willow.

A previous note of mine in 1936, *J. Soc. Brit. Ent.*, **1** (5): 128-129, recorded a number of Hymenoptera bred from a dead willow tree at Slough, Bucks. The tree in question was the crack willow, *Salix fragilis* L.

The following records are of insects bred from an old dead trunk of the cricket bat willow, *Salix alba* var. *caerulea* Smith, situated at Broomfield Mill, near Chelmsford, Essex. This was examined on 3rd May, 1936. The wood was chipped away with a pocket-knife and a number of cocoons and puparia, lying in galleries in the wood, were removed and kept in glass-topped metal boxes in an unheated laboratory.

Eighty-eight greyish cocoons were collected. Sixty-four produced specimens of *Coelocrabro ambiguus* (Dahlb.) (Crabronidae), the host species, twenty-one yielded specimens of the parasite *Habritys brevicornis* (Ratz.) (Chalcididae) and the remaining three dried up and nothing emerged from them. The

host species emerged over a period of fourteen days, *i.e.* from 4th to 18th June, 1936, and the parasites emerged for five days, *i.e.* from 20th to 25th June, 1936. The twenty-one parasitised cocoons produced sixty-six specimens of *H. brevicornis* (Ratz.), three individuals being usually obtained from a single cocoon, as shown in the following table :

Number of *H. brevicornis* (Ratz.) from one cocoon of *C. ambiguus* (Dahlb.)	1	2	3	4	5
Number of cocoons of *C. ambiguus* (Dahlb.)	0	1	16	4	0

Eleven puparia were collected with the cocoons of *C. ambiguus* (Dahlb.). Ten produced specimens of *Ptychoneura cylindrica* Fall. (Tachinidae), which has been frequently bred from the nests of various Crabronidae. They emerged over a period of thirteen days, *i.e.* from 25th May to 6th June, 1936. The remaining puparium which was distinctly larger, produced a specimen of *Eustalomyia festiva* Zett. (Anthomyiidae), which emerged on 4th June, 1936. This is a somewhat rare species, and has probably not been previously recorded from the nests of *C. ambiguus* (Dahlb.). The larvae of these Diptera have similar habits in that they do not live as parasites on the Crabronids, but on the prey with which these wasps provision their nests.

It is with pleasure that I acknowledge my thanks to Dr. O. W. Richards for the identification of *C. ambiguus* (Dahlb.) and Mr. C. J. Wainwright for the identification of *P. cylindrica* Fall. and *E. festiva* Zett.

EDWARD MCC. CALLAN.

Rhacognathus punctatus L. (Hemipt.) preying on Lochmaea suturalis Thoms. (Col.).

On 16th May I found this bug at Linwood, Hants, on a post, with its proboscis inserted between the head and thorax of an almost dead specimen of the beetle. F. H. HAINES.

Cryptorrhynchus lapathi L. (Col.) on Salix alba L. var. coerulea Sm.

Some years ago I planted young trees of the cricket-bat willow to test its possibilities in this neighbourhood.* The *Cryptorrhynchus* has lately extended its very destructive attacks from *S. viminalis* to *S. alba* : the possible economic importance of such choice is obvious. On 27th May imagines were abundant on the stems, many *in cop.* Poplars and alders are still untouched by the pest. F. H. HAINES.

* Linwood, Hants.

Aromia moschata L. (Col.): an unusual pabulum.

On 18th August I found at Linwood a male *Aromia* settled on fresh fox-dung and evidently feeding. F. H. Haines.

Review: British Grasshoppers and their Allies. By Malcolm Burr, D.Sc., F.R.E.S. Pp. xvi+162. With 6 plates, 40 maps and 56 text-figures. Published by Philip Allan and Co., Ltd., London. 1936. Price 6/-.

This little book makes no pretence of being an exhaustive monograph of the British Orthoptera and Dermaptera, but aims solely at stimulating interest in two much neglected orders of insects. 'Relatively little is known of their life-histories, and there is plenty of scope for field observation on their behaviour, their stridulation, courtship, while the problems of geographical distribution, ecology, the origin of our fauna and the evolution of the group offer scope enough for the greediest.' Dr. Burr points out that only eighteen species have been recorded north of a line from the Severn to the Wash.

The first five sections in the book deal with classification, variation, stridulation, fossil Orthoptera and collecting. These are followed by an account of the Dermaptera, in which the five indigenous species and two established exotic species (*Prolabia arachidis* (Yersin) and *Anisolabis annulipes* (Lucas)) are described. The remaining sections deal with the thirty-one British Orthoptera, to which must be added *Conocephalus fuscus* (Fabr.), a species recently established as British by Dr. K. G. Blair; this latter insect is dealt with by Burr as an addendum on a loose leaf. Tables are given to families, subfamilies, genera and species. The descriptions are brief, but are sufficient to make identification a simple matter.

It is noted that the author has followed Zeuner in separating the Tetrigidae from the Acrididae and the Gryllotalpidae from the Gryllidae as distinct families.

An interesting feature of the book is the series of maps showing the distribution of the various species in the British Isles. The six half-tone plates reproduced from photographs are excellent.

The book is a much-needed, well-written and well-produced work. F. J. Killington.

Review: A List of Butterflies and Moths (Macro Lepidoptera) occurring in the neighbourhood of Ashford, Kent. By E. Scott, B.A., M.D. Published by Headley Brothers, Invicta Press, Ashford, Kent, and 109 Kingsway, London, W.C.2. Price 1/6.

This booklet of thirty-two pages (with a large-scale map of the Ashford district) records 462 species of Lepidoptera found

within an eight mile radius of the centre of Ashford. Species taken only since 1918 have been included, so that the records refer solely to 'such species as may be reasonably expected to be met with at the present time.'

'The Ashford district comprises two main collecting areas: the chalk downs and the woods of the Weald. The former are divided into two hill formations by the wide fertile valley of the Stour.'

One notes with pleasure that *Apatura iris* (Linn.), although rare, still persists in the woods of the Weald, and that *Limenitis camilla* (Linn.) and *Polygonia c-album* (Linn.) are now well established in the district. Among the Heterocera many of the rarer and more local species are recorded.

The nomenclature followed for the Rhopalocera is that of the Royal Entomological Society of London (1934, The Generic Names of British Insects, Part 2), and for the Heterocera that of South (The Moths of the British Isles, Series I and II, London). It is, perhaps, a pity that authors' names are not added to the specific names, but the list is well annotated and is a valuable addition to our all too scanty knowledge of the distribution of British insects. The booklet is well printed on good paper and is bound in stiff card covers.

F. J. Killington.

Review: A new entomological journal.

Sweden has always pulled her full weight in entomology; and now the active Entomological Society of Lund has produced a new journal. It is entitled *Opuscula Entomologica,* in memory of Professor C. G. Thomson. It is to appear four times annually, and the subscription is Sw. kr. 10.00 a year (kr. 8.00 to members). The editor is Dr. N. A. Kemner, Keeper in Entomology in the University Museum.

The first part is of thirty-two pages, and contains ten papers varying from five to two pages in length. One paper is histological, two consist of biological and collecting notes, and the remaining seven are systematic, concerning the following orders: Orthoptera (two), Diptera, Lepidoptera, Rhynchota-Homoptera, Ephemeroptera, and Collembola.

A small but not unimportant defect is immediately noticeable; the date is given only as 1936: a modern entomological journal should be dated at least to the month.

G. J. Kerrich.

The Library.

In an earlier number of this Journal (Vol. I, Pt. 4, Oct., 1935) I noted that the production of the library catalogue had been temporarily abandoned, and that only the Separates were available to members.

I am glad to be able to inform members that the catalogue is now in the course of preparation, and will shortly be published, and that all our books are now accommodated in the Library at the University College. They are available for the use of members during ordinary library hours, and also immediately after all general meetings. Books may be borrowed by post (application being made either to myself or to the Assistant Hon. Librarian, Mr. C. J. Banks), or members may themselves fetch them from the Library, signing the Loan Book, which is in the attendant's charge, when they do so.

There was a very generous response to my appeal for reprints, and I should like to remind members that reprints of papers of interest to British entomologists are always welcome.

I wish to make a further appeal to anyone who is willing to help us to extend our Library. The list below indicates the volumes, etc., which are required to complete our various series of periodicals. If anyone is able to help us fill these series, I shall be very glad if he will communicate with me.

The Society possesses (in addition to back numbers of its own publications) many duplicate volumes of various periodicals, including the Entomologist, Ent. Mon. Mag., Trans. Ent. Soc. London, and others. I shall be glad to arrange exchanges (or sales) of these, and will send a full list to anyone interested.

Library Desiderata.

Abstracts of Papers and Annual Reports. Brighton & Hove Nat. Hist. & Phil. Soc.
All before and after 1929.

Abstracts of Proc. South London Ent. & Nat. Hist. Soc.
All before 1892.

Annual Reports. Birmingham Nat. Hist. & Phil. Soc.
All before 1930-31.

Annual Reports. National Library of Wales.
All before and after 1932-33 (publ. 1933).

Annual Rep. & Proc. Lancashire & Cheshire Ent. Soc.
All before and after 1923-27 (publ. 1927).

Bulletins. South-Eastern Union of Sci. Soc.
All before No. 64 (1934).

Entomologist.
All before Vol. X (1877).

Ent. Mon. Mag.
Vols. I (1864-65) to VI (1869-70) and XXI (1884-85) to XXXV (1899).

Ent. Record & Jour. of Variation.
Vols. XXIII (1911) to XXXII (1920) and XXXV (1923).

Fauna & Flora of Haileybury (H. Nat. Hist. Soc.).
All after Pt. I (1888).

Hastings & East Sussex Naturalist.
All before Vol. IV (1931).
Journal. S.-E. Agric. Coll., Wye, Kent.
All before No. 27 (1930).
London Naturalist (Jour., London Nat. Hist. Soc.).
All before 1929.
Natural History of Wicken Fen.
All after Pt. 1 (1923).
Proc. Birmingham Nat. Hist. & Phil. Soc.
All before Vol. XV (1922).
Proc. Bournemouth Nat. Hist. Soc.
All before Vol. XIII (1920-21) and Vol. XXV (1932-33).
Proc. Dorset Nat. Hist. & Antiq. Field Club.
All before Vol. XLIX (1928).
Proc. Isle of Wight Nat. Hist. Soc.
Vol. I (1921), Pts. 2-9.
Report. Hastings & St. Leonards Nat. Hist. Soc.
Reports. National Museum of Ireland.
All before 1928-29.
Reports. Rothamsted Expt. Stat.
All before and after 1927-28 (publ. 1929).
Reports. Winchester Coll. Nat. Hist. Soc.
1872 to 1880; 1883 to 1905-06; 1911-12.
Reports of Proc. Littlehampton Nat. Sci. & Arch. Soc.
All before and after 1931-32 (publ. 1933).
Review of Applied Ent. Series A.
All before Vol. XX (1932).
Rochester Naturalist.
All before and after Vol. VI (1932), No. 132.
Stylops.
All before 1936.
Trans. Cardiff Naturalists' Soc.
All before Vol. LVIII (1925), and Vol. LXVI (1933).
Trans. Carlisle Nat. Hist. Soc.
All after Vol. V (1933).
Trans. Hampshire Entom. Soc., Vol. 3.
Trans. & Jour. Eastbourne Nat. Hist., Photo., & Litt. Soc.
All before Vol. X (1932), No. 2.
Trans. & Proc. Ent. Soc. London.
All before 1868.
Trans. & Proc. Torquay Nat. Hist. Soc.
All before Vol. V (1928-29), Pt. 3.
Year Book. North-Western Naturalists' Union.
All before and after 1928-33 (publ. 1934).
Zoological Record (Insecta).
All before Vol. LXVIII (1931).

D. O. Boyd
(*Hon. Librarian*).

CONTENTS—CONTINUED.

PAGE

GOFFE, E. R. : *Sziladynus luridus* Fall. (Dipt., Tabanidae) taken in England, and a further English locality for *Sziladynus montanus* Meig. 189

HAINES, F. H., M.R.C.S., L.R.C.P., D.P.H. : *Rhacognathus punctatus* L. (Hemipt.) preying on *Lochmaea suturalis* Thoms. (Col.) 194

———— *Cryptorrhynchus lapathi* L. (Col.) on *Salix alba* L. var. *coerulea* Sm. 194

———— *Aromia moschata* L. (Col.): an unusual pabulum 195

HOBBY, B. M., M.A. D.Phil., F.R.E.S.: Notes on the larva of *Phorodesma smaragdaria* F. (Lep.) 183

———— Parasitic Hymenoptera bred from British Lepidoptera - Heterocera by H. C. Hayward, M.A., F.R.E.S. 184

HOBBY, B. M., and POULTON, E. B.: Bees and Conopidae (Dipt.) 180

KILLINGTON, F. J., B.Sc., A.L.S., F.R.E.S. : *Andrena marginata* Fabr. (=*cetii* Sehr.) (Hym.) in Oxfordshire 185

———— *Conops strigatus* Wied. and other Conopidae (Dipt.) in the south of England, 1936 188

LOW, A. M. : Some records of the capture of species of the genus *Helophilus* (Dipt.) at Boston Manor, Middlesex 171

POULTON, SIR EDWARD B., D.Sc., F.R.S., F.R.E.S.: Emergence of the parasitic Ichneumonid *Orthopelma luteator* Grav. from the gall of *Rhodites rosae* (L.) 179

———— Notes on the larvae and pupation of the Geometrid Moth *Phorodesma smaragdaria* F. (Lep.) 181

RUSSELL, S. G. C.: *Limenitis camilla* Linn., ab. *nigrina* Weym. (Lep.) 188

HON. EDITORS : Research on the Bed-bug : An Appeal 171

HON. LIBRARIAN : The Library 196

REVIEWS 195

Communications for the *Journal* should be sent to the Editor at :—

9, Bullar Road, Bitterne Park, Southampton.

SOCIETY FOR BRITISH ENTOMOLOGY

List of Publications for Sale at the Nett Prices shewn.

(All prices are post free.)

SYSTEMATIC WORKS.

British Hemiptera-Heteroptera. By H. P. Jones, 1930. 88 pp., 2 Pls. 4*s.* 6*d.*

British Neuroptera. By F. J. Killington, 1929. 36 pp., 6 Pls., 6 Figs. 4*s.* 0*d.* With Supplement (*Hemerobius*), 1934, 5*s.* 6*d.*

British Tabanidae (Dipt.). By E. R. Goffe, 1930. 71 pp., 2 Pls. 5*s.* 0*d.*

British Tipulinae (Dipt.). By H. L. F. Audcent, 1932. 35 pp., 3 Pls. 4*s.* 0*d.*

Keys to British Asilidae (Dipt.). By B. M. Hobby, 1932. 6 pp. 1*s.* 9*d.*

Meigen's 'Nouv. Class.' 1800. By E. R. Goffe, 1932. 7 pp. 1*s.* 0*d.*

British Liriopeidae (Dipt.). By H. L. F. Audcent, 1934. 12 pp., 4 Pls. 1*s.* 9*d.*

British Mecoptera (Synopsis and Feeding Habits). By B. M. Hobby and F. J. Killington, 1934. 11 pp., 2 Pls. 1*s.* 6*d.*

GENERAL WORKS.

'Entomology and Ethics.' By W. Fassnidge (Presidential Address, 1931), 1932. 16 pp. 1*s.* 0*d.*

FAUNAL LISTS.

Tortrices of Hants and I.O.W. By W. Fassnidge, 1929. 20 pp. 1*s.* 6*d.*

Macro-Lepidoptera of Hants and I.O.W. By W. Fassnidge, 1925. 42 pp. 1*s.* 6*d.*

Hymenoptera Aculeata of Hants and I.O.W. By H. P. Jones, 1926. 13 pp. 1*s.* 0*d.* With Supplement, 1932, 1*s.* 6*d.*

Paraneuroptera of Hants and I.O.W. By F. J. Killington, 1926. 9 pp. 1*s.* 0*d.*

List of British Collembola. By F. A. Turk, 1933. 6 pp. 1*s.* 0*d.*

List of Dorset Lepidoptera. By W. P. Curtis. Introduction and Part I, 1934. 102 pp. annotated. 7*s.* 6*d.*

Other Faunal Lists no longer available as separates will be found in the Transactions and Journal.

GENERAL WORKS.

Bibliography of Entom. Notes in Publications of British Local Societies. (An indispensable Supplement to the Zoological Record.)

Part I, 1933. 24 pp. 2*s.* 6*d.*
Part II, 1934. 18 pp. 2*s.* 6*d.*
Part III, 1935 (The Naturalist). 67 pp. 2*s.* 6*d.*

SERIAL PUBLICATIONS.

ENT. SOC. S. ENGL. THE JOURNAL.

Parts I–IV, 1932–33 (in all 112 pp., 1 Pl.). 2*s.* 6*d.* each.

THE TRANSACTIONS.

No. IV,	1928	4*s.* 0*d.*
No. V,	1929	7*s.* 6*d.*
No. VI,	1930	*out of print.*
Vol. VII,	Part 1, 1931 ...	7*s.* 0*d.*
Vol. VII,	Part 2, 1932 ...	10*s.* 6*d.*
Vol. VIII,	Part 1, 1932 ...	8*s.* 0*d.*
Vol. VIII,	Part 2, 1933 ...	7*s.* 0*d.*

Transactions Nos. 1—3 were issued by the Hampshire Entomological Society and are out of print. Copies, however, are sometimes available, and particulars of any on hand may be had on request.

SOC. BRIT. ENT. THE JOURNAL.

Vol. I, Part 1, May, 1934	...	2*s.* 6*d.*
Vol. I, Part 2, Oct., 1934	...	2*s.* 6*d.*
Vol. I, Part 3, April, 1935	...	2*s.* 6*d.*
Vol. I, Part 4, Oct., 1935	...	2*s.* 6*d.*
Vol. I, Part 5, March, 1936	...	2*s.* 6*d.*
Vol. I, Part 6, August, 1936	...	2*s.* 6*d.*

THE TRANSACTIONS.

Vol. I, Part 1, June, 1934.	10*s.* 6*d.*
Vol. I, Part 2, Nov., 1934	12*s.* 0*d.*
Vol. II, Part 1, July, 1935.	12*s.* 0*d.*
Vol. II, Part 2, Oct., 1935.	12*s.* 0*d.*
Vol. III, Nov., 1936	17*s.* 6*d.*

The list of Contents of any Volume will be sent on request.

The Subscription to the Society, which includes copies of all matter published during the period covered, is 21*s.* 0*d.* per annum. There is no entry fee.

Orders, accompanied by the appropriate remittance, should be addressed to **E. Rivenhall Goffe,** Hon. Sec., 102, High Street, **Southampton.**

595.7002
.S66
Insects

VOL. 1. PART 8.

JOURNAL
OF THE
SOCIETY FOR BRITISH ENTOMOLOGY

SMITHSONIAN INSTITUTION
APR 18 1938
NATIONAL MUSEUM

EDITOR:
F. J. KILLINGTON, B.Sc., A.L.S., F.R.E.S., F.S.B.E.

ASSISTANT EDITOR:
B. M. HOBBY, M.A., D.PHIL., F.R.E.S.

DATE OF PUBLICATION: 31ST MARCH, 1938.
Copies may be purchased from the Secretary at 102, High Street, Southampton.

Price 2s. 6d., post free.

CONTENTS.

PAGE

ANDREWS, H. W., F.R.E.S.: *Volucella zonaria* Poda (Dipt., Syrph.): A tantalising find 210

BANKS, C. J., B.Sc.: On the Occurrence of Nematodes in *Corixa geoffroyi* Leach (Hemiptera, Corixidae) 217

BROWN, S. C. Scarsdale: Nomenclature of the Coniferae ... 224

———— The Status of *Gracilaria azaleella* Brants (Lep., Tineina) in the British Isles 224

———— The food-plant of *Evetria sylvestrana* Curt. (Lep.) 225

CAPENER, A. L.: Notes on a spider parasite, believed to be *Colpomeria quadrisculpta* Gr. (Hym. Ichn.) 209

CARPENTER, PROF. G. D. Hale, D.M., F.L.S., F.R.E.S.: *Arctia plantaginis* Linn. (Lep.) eaten by swifts 213

———— Tits feeding upon butterflies 214

———— A note on some parasites of *Zygaena* (Lep.): Addendum 216

CARR, PROF. J. W., M.A., F.L.S., F.R.E.S.: Obituary: Hugh Parry Jones 212

CHAWNER, E. F., F.R.E.S.: *Limenitis camilla* Linn. (Lep., Nymph.) on wing in October 212

COTTAM, R.: A note on a thrush feeding on Emperor and Tiger Moths 235

CURTIS, W. Parkinson, F.R.E.S.: *Peronea hastiana* Linn. ab. nov. *postmaculana* (Lep.) 219

———— *Eupithecia distinctaria* Herr-Schäff. (Lep.) 226

DIBB, J. R., F.R.E.S.: Insects attracted to light? 214

———— Cornish Coleoptera 215

EDWARDS, F. W., M.A., Sc.D., F.R.E.S., F.S.B.E.: Notes on the Mycetophilidae (Dipt.) obtained by Dr. C. B. Williams in a light-trap at Harpenden, Herts 199

FRASER, F. C., M.D., F.R.E.S.: *Leptidea sinapis* (Linn.) (Lep.), second brood 229

———— *Eumicromus angulatus* (Stephens) (Neur.) in the New Forest, 1937 229

FREER, W. L.: *Agrotis simulans* Hufn. (Lep.) in Wiltshire 216

GARRETT, F. C., O.B.E., D.Sc.: *Plusia moneta* Fabr. (Lep.) in Scotland 233

[*Continued on page 3 of cover.*]

JOURNAL OF THE SOCIETY FOR BRITISH ENTOMOLOGY

VOL. I. 31ST MARCH, 1938. PART 8.

Notes on the Mycetophilidae (Dipt.) obtained by Dr. C. B. Williams in a light-trap at Harpenden, Herts.

During the years 1932-36 an automatic light-trap for insects has been in use at the Rothamsted Experimental Station at Harpenden, Herts. The construction of the trap and a summary of the results obtained have recently been described by Williams,[1] and more detailed studies on the material collected have been made by Pinchin and Anderson[2] on the Tipuline craneflies, and by Killington[3] on the Neuroptera. As explained by these writers, the main interest of the collections lies in the fact that exact records were kept of the climatic conditions and also of the period of the night when the insects were caught, the latter data being provided by an automatic bottle-changing mechanism which divided the night into eight equal periods.

On the invitation of Dr. C. B. Williams I undertook the examination of part of the collection of Diptera, in particular the Mycetophilidae. Owing to the large amount of material involved it was impossible to find time to study the whole of the collections; the following notes are, therefore, based only on the material collected during 1934, all of which was examined, together with that obtained on a few sample days in the summer of 1935.

CEROPLATINAE (including MACROCERINAE).

Apart from occasional specimens of *Macrocera* (*M. anglica* Edw. and *M. phalerata* Mg.), the only representative of the subfamily found in the trap was *Platyura* (*Monocentrota*) *lundströmi* Edw., a small black species which is usually considered very scarce, the only specimen previously found in Britain being one taken in Northumberland (on a tent-roof at dawn) in 1923; another was taken in Manchester in 1936.

Several specimens of *P. lundströmi* were taken in the light-trap during 1932, and the following during 1934:

[1] 1935, *Trans. R. Ent. Soc. London*, **83**: 523-555.
[2] 1936, *Proc. R. Ent. Soc. London*, A, **11**: 69-78.
[3] 1935, *Trans. Soc. Brit. Ent.*, **2** (2): 145-150.

APR 16

14th June, time not recorded, 1 ♀.
18th July, night-period 7, 1 ♂.
,, ,, 8, 2 ♂♂.
8th Aug., ,, ,, 1 ♂.
16th Aug., ,, ,, 1 ♀.
21st Aug., ,, ,, 1 ♂.
3rd Sept., ,, ,, 1 ♂.

Two more males were caught during period 8 on 18th June, 1935.

These records clearly indicate that *P. lundströmi* is regularly attracted to light and that its time of activity is about dawn; the latter fact may provide an explanation of its apparent scarcity.

Sciophilinae.

Apart from one or two stray specimens of *Boletina* (probably *B. gripha* Dz.) and *Sciophila lutea* Mcq., the only species of this subfamily of regular occurrence in the light-trap was *Paratinia sciarina* Mik. This is not a little surprising, as *P. sciarina* is a species which is but seldom taken by sweeping. The numerous light-trap captures suggest that it is definitely a nocturnal insect, with a flight-period late in the night, like *Platyura lundströmi* Edw.; it is worth noting that these two species are of similar size and build, and both are almost uniformly black.

Many specimens of *P. sciarina* were taken in the trap, during 1932, without observations on the time of flight. Those taken during 1934-36 were nearly all found in bottles 7 or 8, and 20 out of 21 specimens examined were males. The following are the records:

Period	4	5	6	7	7-8	8
May, 1934 ...						2
June, 1934 ...			1			1
Aug., 1934 ...				1		
Sept., 1934 ...						2
Oct., 1934 ...						4
Dec., 1934 ...					2	
June, 1935 ...	1	1		3		2
Aug., 1936 ...						1

In all cases but one (where two males were taken in the same bottle) the specimens occurred singly. The single female was the specimen taken in bottle 6.

Sciarinae.

Flies of this subfamily formed at times a very large proportion of the total captures in the light-trap. This was particularly the case during October, 1934, when a single night's catch of Sciarinae often amounted to several hundred specimens, and on one occasion to over two thousand. By far the greater proportion of these large catches consisted of females, and on this account it is difficult if not impossible to tabulate exact statistics, the females of many of the smaller species being hardly distinguishable. Among the two thousand specimens captured on 7th October only eight males were found, these belonging to four different species (*S. pullula* Winn., *S. varians* (Joh.) Edw., *S. vivida* Winn. and another species related to *S. vivida*); it is probable that other species in addition to these four were represented among the females.

The following species were recognised among the light-trap material taken during 1934:

S. (*Neosciara*) *carbonaria* Mg., a few ♂♂, May.
,, ,, *umbratica* Zett., occasional ♀♀ and one or two ♂♂.
,, ,, *brunnipes* Mg., frequent, May to October.
,, ,, *flavicauda* Zett., 1 ♂, 16th July.
,, ,, *hyalipennis* (Mg.) Winn., two or three ♀♀.
,, ,, *nervosa* Mg., 1 ♂, 20th October.
,, ,, *nitidicollis* Mg., several ♂♂, end of May and in October.
,, ,, *varians* (Joh.) Edw., October
,, ,, *pullula* Winn., ,, } A few ♂♂, very
S. (*Scatopsciara*) *vivida* Winn., ,, } numerous ♀♀.
,, ,, sp. near *vivida* Winn., ,,
S. (*Plastosciara*) *lignicola* Winn., 2 ♂♂, 30th July.

Of these species the only one which was constantly met with (though in small numbers) in the light-trap catches throughout the summer of 1934 was *S. brunnipes* Mg. Fortunately this species is also one which is recognisable with a fair degree of certainty in both sexes, and it has, therefore, been possible to tabulate its occurrences. As shown in the accompanying table, *S. brunnipes* has a well-marked flight-period in the early part of the night (periods 1 and 2), with very little activity later in the night, but some slight indication of another flight at dawn. This is in contrast with what was found in the case of the small black species (*S. pullula, vivida* and others) in which the greatest numbers of specimens were captured during the last four periods of the night; thus the total numbers of Sciarinae other than *S. brunipes* obtained during October, 1934, were as follows:

Period	1	2	3	4	5	6	7	8
Number ...	438	620	814	546	1143	617	877	894

In summarising the results obtained with the trap, Williams noted the apparent discrepancy between the period of maximum catches of *Sciara* in the years 1933-34 and 1934-35, the maximum in the first year falling in period 1 and in the second year in period 5, with a high average throughout the night. A probable explanation of the discrepancy is that the small species have a later flight-maximum than *S. brunnipes,* and that up to September, 1934, comparatively few of these small species were captured.

In *S. brunnipes* the preponderances of females over males captured was not quite so excessive as in some of the other species.

TABLE OF SPECIMENS OF *SCIARA BRUNNIPES* MG. TAKEN IN LIGHT-TRAP DURING 1934.

Period	1		2		3		4		5		6		7		8		Total	
	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀
May 11th-31st	0	5	0	6	0	6	—		—		—		—		0	1	0	13
June	0	11	0	9	0	1	—		0	1	0	1	—		—		0	23
July	2	33	0	21	0	2	—		—		—		—		0	2	2	58
Aug.	1	16	0	3	—		—		0	1	—		0	1	0	1	1	22
Sept.	4	47	1	13	0	6	0	7	1	6	—		1	2	1	5	8	86
Oct. 4th	3	81	0	17	0	5	2	14	1	13	0	11	0	9	9	17	15	167
Dec. 3rd	—		—		—		—		—		—		—		—		0	1
Totals ...	10	194	1	69	0	15	2	23	2	22	0	12	1	12	10	26	26	373

F. W. EDWARDS.

British Ephemeroptera, Plecoptera and Trichoptera in 1936.

This list is based upon material sent to Mr. M. E. Mosely or myself for determination, or for the purpose of recording. For the sake of brevity, initials have been used to indicate collectors' names, as follows:—H.D., Mr. H. Donisthorpe; L.W.G., Rev. Prof. L. W. Grensted; A.D.G., Master A. D. Grensted; O.G., Mrs. O. Grey; J.H.H., Prof. J. Heslop Harrison; D.E.K., Mr. D. E. Kimmins; M.E.M., Mr. M. E. Mosely; O.W.R., Dr. O. W. Richards; J.S., Dr. J. Smart; and A.R.W., Mr. A. R. Waterston.

Specimens are recorded from the following localities: — DEVON, N.: Bampton. SOMERSET, S.: Bicknoller, Carhampton, Dulverton, Dunster, Kilve, Luccombe, Monksilver, Norton Fitzwarren, Roadwater, Simonsbath, Washford, Wheddon Cross, Williton, Withycombe. HANTS, N.: North Warnborough.

[4] These figures include abnormal catches on October 6th of 4 ♂♂, 8 ♀♀ during period 8, and on October 11th of 44 ♀♀ during period 1.

Sussex, E.: Nutley. Kent, W.: Edenbridge. Surrey: Dry Hill. Herts: Hitchin. Berks: Gayford, Swallowfield, Windsor. Oxford: Burford, Charlbury, Deddington, Eynsham, Oxford, Thame, Woodstock. Suffolk, E.: Fritton. Cambridge: Barrington, Cambridge, Grantchester, Shepreth Mill. Northampton: Towcester. Warwick: Marton, Stonebridge. Stafford: Lichfield. Salop: Leebotwood, Ludlow. Brecknock: Talybont-on-Usk. Lincoln, S.: Stamford. Notts: Southwell. Derby: Repton, Swanwick. Cheshire: Astbury, Chelford, Wilmslow. Lancs, N.: Wray Castle. Yorks, N.E.: Glasshouses Dam. Yorks, Mid-W.: Bolton Abbey, Harrogate, Ingleton, Wetherby. Yorks, N.W.: Bainbridge, Semmerwater, Swaledale. Durham: Durham, Seaton Carew, Team Valley. Northumberland: Alnwick, Chesterholm, Chollerford, Corbridge, Greenhead, Haltwhistle Burn, Hexham, Little Houghton, Riding Mill, Ross Links. Westmorland: Shap, Ulleswater. Cumberland: Banks, Gilsland, Lanercost. Isle of Man: Archallagan, Douglas. Peebles: Gameshope Loch. Selkirk: Akermoor Loch. Edinburgh: Balerno, Currie, Stow. Perth, S.: Dunning, Glen Farg, L. of Menteith. Perth, Mid: Allt Leathan, Fortingall, L. Tay, White Bridge. Easterness: L. Garten, Granish. Argyle: L. Awe. O. Hebrides: Barra. Donegal: L. Gartan.

EPHEMEROPTERA.

Ephemeridae.

Ephemera vulgata L.—Marton, 1.vi. (L.W.G.).

E. danica Müll.—Lough Gartan, 12.vii.35 (Col. Maxtone Moore). Stow, 23.vi. (A.R.W.). Glasshouses Dam, 27.vi. (A. H. Ingleby). Bainbridge, 28.vi. (O.W.R.).

Leptophlebiidae.

Leptophlebia marginata (L.).—Akermoor Loch, 1,000 ft., 31.v.; Lake of Menteith, 26.iv. (A.R.W.).

Paraleptophlebia submarginata (Steph.).—Alnwick, 23.v.; Riding Mill, 19.vi. (A. H. Ingleby).

P. cincta (Retz.).—Bainbridge, 28.vi. (O.W.R.). Harrogate, 3.vii. (A. H. Ingleby). Talybont-on-Usk, 24.vii-12.viii. (J. Henderson). Monksilver, 4.viii.; Dunster, 9.viii. (A.D.G.).

Habrophlebia fusca (Curt.).—Deddington, 1-12.vi. (L.W.G.). Thame, 14.vi.; Chesterholm, 1.ix. (A.D.G.). Riding Mill, 12.viii. (A. H. Ingleby).

Ephemerellidae.

Ephemerella ignita (Poda).—Balerno, 7.vii, 5.viii. (A.R.W.). Bainbridge, 10.vii. (O.W.R.). Riding Mill, 12.viii. (A. H. Ingleby). Washford, 6.viii. (L.W.G.). Kilve, 10.viii. (L.W.G., A.D.G.). Williton, 14.viii. (A.D.G.). Gilsland, 2.ix. (L.W.G.).

CAENIDAE.

Caenis macrura Steph. — Stamford, in cobweb, 17.vii. (L.W.G.).

C. rivulorum Etn.—Bolton Abbey, vi. (F. Napier Sutton).

BAËTIDAE.

Baëtis pumilus (Burm.).—Kilve, 10.viii.; Chollerford, 30.viii.; Gilsland, 2.ix. (A.D.G.). Corbridge, 28.viii. (L.W.G.). Haltwhistle Burn, 1.ix. (L.W.G., A.D.G.).

B. niger (L.).—Monksilver, 4.viii. (A.D.G.).

B. scambus Etn. — Bolton Abbey, vi. (F. Napier Sutton). Monksilver, Carhampton, 4.viii.; Chesterholm, 1.ix. (A.D.G.). Washford, 6.viii.; Hexham, 30.viii. (L.W.G.). Bainbridge, 28.vi. (O.W.R.).

B. rhodani (Pict.).—Edenbridge, 10.iv. (D.E.K.). Gameshope Loch, 1,800 ft., 17.v.; Currie, 18.v.; Stow, 21.v. (A.R.W.). Little Houghton, 23.v. (A. H. Ingleby).

B. bioculatus (L.).—Wilmslow, 27.viii.; Woodstock, 1.ix. (A.D.G.). Stonebridge, 5.ix. (L.W.G., A.D.G.). Riding Mill, 12.x. (A. H. Ingleby).

B. tenax Etn.—Currie, 17.vi. (A.R.W.).

Centroptilum luteolum (Müll.).—Barra, 17-28.viii. (A.R.W.). Haltwhistle Burn, 1.ix. (A. D. G.). Oxford, 10.ix. (L.W.G.).

Cloëon simile Etn.—Barra, 17-28.viii. (A.R.W.).

C. rufulum Müll. — Lough Gartan, 12.vi.35 (Col. Maxtone Moore).

SIPHLONURIDAE.

Siphlonurus lacustris Etn. — Balerno, 7.vii.; Gairloch, 16-24.vii. (A.R.W.).

S. linneanus Etn.—Lough Gartan, vii. (Commander Wyndham Forbes).

ECDYONURIDAE.

Heptagenia sulphurea (Müll.).—Lough Gartan, 12.vii.35 (Col. Maxtone Moore). Hexham, 12.vi.; Wetherby, 26.vi. (A. H. Ingleby). Corbridge, 28.viii. (L.W.G.). Chollerford, 30.viii. (A.D.G.).

Ecdyonurus insignis (Etn.).—Bainbridge, 28.viii. (O.W.R.).

E. lateralis (Curt.).—Buttertyles, 26.vi.; Bainbridge, 2.vii. (O.W.R.). Balerno, 7.vii. (A.R.W.).

E. longicauda (Steph.). — Luccombe, 8.viii.; Chollerford, 29.viii. (L.W.G.). Riding Mill, 23.viii. (A. H. Ingleby).

E. venosus (Fabr.). — Riding Mill, 19.v. (A. H. Ingleby). Stow, 21.vi. (A.R.W.).

Rhithrogena semicolorata (Curt.). — Bolton Abbey, vi. (F. Napier Sutton). Stow, 21.v.; Balerno, 26.v. (A.R.W.). Riding Mill, 25.v.; Hexham, 12.vi. (A. H. Ingleby). Swaledale, 26.vi.; Bainbridge, 3.vii. (O.W.R.). Monksilver, 4.viii.; Washford, 5.viii. (A.D.G.).

PLECOPTERA.

PERLIDAE.

Isoperla grammatica (Scop.). — Fortingal, 18.vi.35 (J.S.). Dunning, vii.; Glen Farg, viii. (O.G.). Bicknoller, 5.viii. (L.W.G.).

Chloroperla torrentium (Pict.). — Loch Garten, 28.v.34 (W. H. T. Tams). Semmerwater, 22.vi.; Ulleswater, 24.vi. (O.W.R.). Fortingal, 17.vi.35; Loch Tay, Fearnan, and White Bridge, 18.vi.35; Wray Castle, Watbarrow Point, 17.vi. (J.S.). Dunning, vi. (O.G.). Washford, 5.viii. (L.W.G.).

C. tripunctata (Scop.).—Swaledale, 28.vi. (O.W.R.).

CAPNIIDAE.

Capnia nigra (Pict.).—Nutley, 27.iii. (L.W.G.).

C. atra Morton.—Loch Awe, v. (M.E.M.).

TAENIOPTERYGIDAE.

Taeniopteryx risi Morton. — Granish, 27.v.34 (W. H. T. Tams). N.W. Yorks, 25.vi. (O.W.R.).

Nephelopteryx nebulosa (L.).—Oxford, 16.iii. (L.W.G.).

LEUCTRIDAE.

Leuctra geniculata Steph. — Williton, 18.viii.; Chollerford, 30.viii. (A.D.G.). Haltwhistle Burn, 1.ix. (L.W.G.).

L. fusciventris Steph.—Washford, 5.viii.; Dunster, 8.viii.; Simonsbath, 13.viii.; Hexham, 30.viii.; Chesterholm, Lanercost, 1.ix.; Gilsland, 2.ix.; Banks, 3.ix.; Woodstock, 13.ix. (A.D.G.). Carhampton, 9.viii.; Dulverton, 19.viii.; Corbridge, 28.viii.; Haltwhistle Burn, 1.ix.; Greenhead, 2.ix. (L.W.G.). Dunning, vii. (O.G.).

L. hippopus Kempny.—Nutley, 28.iii. (L.W.G.). L. Awe, v. (M.E.M.).

L. inermis Kempny.—White Bridge, 18.vi.35; Allt Leathan, 19.vi.35 (J.S.). Swaledale, 28.vi. (O.W.R.). Dunning and Ochie Hills, Glen Farg, vii. (O.G.).

NEMOURIDAE.

Protonemura meyeri (Pict.).—N.W. Yorks, 25.vi. (O.W.R.).

Amphinemura cinerea (Ol.). — Fortingal, 17.vi.35; White Bridge, 18.vi.35 (J.S.). Shap, 24.vi.; Swaledale, 26.vi.; Ingleton, 1.vii.; Bainbridge, 10.vii. (O.W.R.). Dunning and Glen Farg, vii. (O.G.).

A. standfussi Ris.—Deddington, 1.vi. (L.W.G.).

Nemoura variegata Ol.—Nutley, 28.iii. (L.W.G.). Dry Hill, 10.iv. (D.E.K.). Towcester, 10.v. (L.W.G.). Thame, 14.vi. (A.D.G.). Dunning, vii. (O.G.).

N. dubitans Mort.—Fritton, iv. (C. Morley).

N. avicularis Mort.—L. Awe, v. (M.E.M.).

Nemurella inconspicua (Pict.).—Granish, 27.v.34 (W. H. T. Tams). Simonsbath, 13.viii. (A.D.G.).

PHRYGANEIDAE.

Phryganea varia Fabr.—Archallagan, 9.vii.34 (W. S. Cowin).

LIMNOPHILIDAE.

Colpotaulius incisus (Curt.).—Ross Links, ix.; Seaton Carew (J.H.H.).

Limnophilus rhombicus (L.).—Team Valley (per J.H.H.).

L. marmoratus Curt.—Woodstock, 1.xi. (A.D.G.).

L. lunatus Curt.—Thame, 14.vi.; Chelford, 26.viii.; Hitchin, 6.x. (A.D.G.). Cambridge, 22.ix. (L.W.G.). Corbridge, ix. (J.H.H.).

L. elegans Curt.—Seaton Carew (J.H.H.).

L. politus McL.—Cambridge, 22.ix.; N. Warnborough, Basingstoke Canal, 28.ix. (L.W.G.).

L. vittatus (Fabr.).—Ross Links and Corbridge, ix.; Durham, x. (J.H.H.).

L. auricula Curt.—Ross Links and Corbridge, ix. (J.H.H.).

L. griseus (L.).—Ross Links, ix. (J.H.H.).

L. bipunctatus Curt.—Team Valley (per J.H.H.).

L. extricatus McL.—Hitchin, 20.vi. (A.D.G.).

L. hirsutus (Pict.).—Seaton Carew (J.H.H.).

L. sparsus Curt.—Douglas, 23.vi.35 (W. S. Cowin). Seaton Carew (J.H.H.).

L. fuscicornis Ramb.—Oxford, 31.vii. (L.W.G.).

Anabolia nervosa (Curt.).—Corbridge, 28.viii.; Cambridge, 22.ix.; Swallowfield, R. Loddon, 28.ix.; Stonebridge, 30.ix. (L.W.G.). Chollerford, 30.viii.; Eynsham, 17.ix. (A.D.G.).

Stenophylax stellatus (Curt.).—Corbridge, ix. (J.H.H.). Charlbury, 9.ix. (H. Scott).

S. rotundipennis (Brauer).—Eynsham, 17.ix. (A.D.G.).

S. latipennis (Curt.).—Simonsbath, 13.viii. (L. W. G.). Chesterholm, 1.ix. (A.D.G.).

S. permistus McL.—Seaton Carew (J.H.H.).

Micropterna sequax McL.—Team Valley (per J.H.H.).

Halesus radiatus (Curt.).—Eynsham, 17.ix. (A.D.G.). Cambridge, 24.ix. (L.W.G.). Team Valley (per J.H.H.).

H. auricollis (Pict.).—Corbridge, ix.; Durham, x. (J.H.H.).

Drusus annulatus (Steph.).—Hitchin, 20.vi.; Simonsbath, 13.viii.; Carhampton, 18.viii.; Gilsland, 3.ix. (A.D.G.).

Chaetopteryx villosa (Fabr.).—Oxford, 1.xi. (A.D.G.).

SERICOSTOMATIDAE.

Sericostoma personatum (Spence).—Shepreth Mill, 13.vii.; Wheddon Cross, 13.viii.; Dulverton, 19.viii.; Norton Fitzwarren, 19.viii.; Bampton, 19.viii. (L.W.G.). Dunster, 16.viii. (A.D.G.).

Notidobia ciliaris (L.).—Oxford, 16.v. (L.W.G.).

Goëra pilosa (Fabr.).—Burford, 16.vi. (A.D.G.). Southwell, 17.vii. (L.W.G.).
Silo pallipes (Fabr.).—Williton, 18.viii. (A.D.G.). Dulverton, 19.viii. (L.W.G.).
Crunoecia irrorata (Curt.).—Windsor, 14.vi. (H.D.).
Lepidostoma hirtum (Fabr.).—Chollerford, 30.viii. (A.D.G.). Hexham, 30.viii. (L.W.G.).

MOLANNIDAE.

Molanna angustata Curt.—Stamford, 17.vii. (L.W.G.).

BERAEIDAE.

Beraea pullata Curt.—Windsor, 14.vi. (H.D.).
B. maurus Curt.—Bicknoller, 11.viii. (A.D.G.).

ODONTOCERIDAE.

Odontocerum albicorne (Scop.).—Bicknoller, 6.viii.; Withycombe, 9.viii.; Bishops Lydeard, 16.viii.; Dunster, 16.viii.; Luccombe, 20.viii.; Greenhead, 2.ix. (A.D.G.).

LEPTOCERIDAE.

Leptocerus alboguttatus Hag.—Dunning, vii. (O.G.).
L. aterrimus Steph.—Shepreth Mill, 13.vii.; Cambridge, 16.vii.; Astbury, 5.ix. (L.W.G.).
L. cinereus Curt.—Repton, 21.vii. (L.W.G.). Corbridge, 28.viii. (A.D.G.).
L. albifrons (L.).—Washford, 5.viii.; Williton, 14.viii.; Dunster, 16.viii.; Roadwater, 19.viii. (A.D.G.). Dulverton, 19.viii.; Corbridge, 28.viii.; Hexham, 30.viii. (L.W.G.).
L. commutatus Rost.—Chollerford, 30.viii. (A.D.G.). Donning, vii. (O.G.).
L. bilineatus (L.).—Kilve, 10.viii. (A.D.G.). Leebotswood, 23.viii. (A.D.G., L.W.G.).
L. dissimilis Steph.—Chollerford, 30.viii. (A.D.G.). Corbridge, 28.viii. (L.W.G.). Hexham, 30.viii. (A.D.G., L.W.G.).
Mystacides nigra (L.).—Grantchester, 15.vii.; Cambridge, 22.ix. (L.W.G.). Bishops Lydeard, 16.viii. (A.D.G.).
M. azurea (L.).—Deddington, 21.vii.; Corbridge, 28.viii. (L.W.G.). Chollerford, 30.vii.; Eynsham, 17.ix. (A.D.G.).
M. azurea var. *albicornis* Mosely.—Chollerford, 30.viii.; Corbridge, 28.viii. (A.D.G.). Hexham, 30.viii. (A.D.G., L.W.G.). Stonebridge, 5.ix. (L.W.G.).
M. longicornis (L.).—Swanwick, 19.vii. (L.W.G.).
Setodes tineiformis (Curt.).—Woodstock, 15.ix. (L.W.G.).
Adicella reducta (McL.).—Withycombe, 2.viii.; Bicknoller, 6.viii.; Kilve, 10.viii. (A.D.G.).

HYDROPSYCHIDAE.

Hydropsyche fulvipes (Curt.).—Bicknoller, 11.viii. (A.D.G.).
H. instabilis (Curt.).—Kilve, 10.viii. (L.W.G.). Williton,

14.viii.; Chollerford, 30.viii. (A.D.G.). Dunning, vii. (O.G.).

H. angustipennis (Curt.).—Marton, 1.vi.; Cambridge, 22.ix. (L.W.G.). Wilmslow, 27.viii. (A.D.G.).

Diplectrona felix McL.—Bicknoller, 6.viii.; Luccombe, 8.viii. (A.D.G.).

PHILOPOTAMIDAE.

Philopotamus montanus (Don.).—Bicknoller, 6.viii. (A.D.G.). Luccombe, 20.viii. (L.W.G.).

Wormaldia occipitalis (Pict.).—Bicknoller, 11.viii.; Chesterholm, 1.ix. (A.D.G.). Luccombe, 20.viii. (L.W.G.).

W. subnigra McL.—Simonsbath, 13.viii.; Dunster, 14.viii.; Greenhead, 2.ix. (A.D.G.). Banks, 3.ix. (L.W.G.).

POLYCENTROPIDAE.

Neureclipsis bimaculata (L.).—Eynsham, 17.ix. (A.D.G.).

Plectrocnemia conspersa (Curt.).—Dunster, 16.viii.; Chesterholm, 1.ix.; Greenhead, 2.ix. (A.D.G.).

Polycentropus flavomaculatus (Pict.).—Monksilver, 4.viii.; Kilve, 10.viii.; Simonsbath, 13.viii.; Dunster, 11.viii.; Bishops Lydeard, 16.viii.; Williton, 18.viii.; Roadwater, 19.viii.; Ludlow and Leebotswood, 23.viii.; Corbridge, 28.viii.; Woodstock, 13.ix.; Gayford, 14.ix. (A.D.G.). Cutthorne, 13.viii.; Dulverton, 19.viii.; Cambridge, 22.ix. (L.W.G.).

P. multiguttatus Curt.—Dunster, 16.viii. (A.D.G.).

P. kingi McL.—Simonsbath, 13.viii. (Peter Grensted).

Holocentropus stagnalis (Albda.).—Seaton Carew (J.H.H.).

Cyrnus trimaculatus (Curt.).—Lichfield, 3.vi.; Stamford, 17.vii.; Deddington, 21.vii.; Kilve, 10.viii.; Dulverton, 19.viii.; Bampton, 19.viii. (L.W.G.). Burford, 16.vi.; Dunster, 11.viii.; Williton, 14.viii. (A.D.G.).

PSYCHOMYIIDAE.

Tinodes waeneri (L.).—Southwell, 17.vii.; Bampton, 19.viii.; Cambridge, 22.ix. (L.W.G.). Bishops Lydeard, 16.viii.; Chollerford, 30.viii.; Stonebridge, 5.ix.; Eynsham, 7.ix. (A.D.G.).

T. aureola (Zett.).—Williton, 14, 18.viii. (A.D.G.).

T. unicolor (Pict.).—Deddington, 21, 27.vii. (L.W.G.).

Psychomyia pusilla (Fabr.).—Dunster, 11.viii.; Williton, 18.viii.; Chollerford, 30.viii.; Stonebridge, 5.ix. (A.D.G.). Corbridge, 28.viii.; Hexham, 30.viii. (L.W.G.).

Lype phaeopa Steph.—Washford, 5.viii.; Luccombe, 8.viii.; Kilve, 10.viii.; Williton, 18.viii.; Chelford, 26.viii.; Woodstock, 13.ix.; Gayford, 14.ix. (A.D.G.).

L. reducta Hag.—Leebotswood, 23.viii. (A.D.G., L.W.G.). Luccombe, 20.viii.; Williton, 18.viii.; Carhampton, 2-4.viii. (A.D.G.).

RHYACOPHILIDAE.

Rhyacophila dorsalis Curt. — Washford, 5.viii.; Williton, 14.viii.; Ludlow, 23.viii.; Chollerford, 30.viii.; Chesterholm, 1.ix.; Gilsland, 3.ix. (A.D.G.). Dulverton, 19.viii.; Corbridge, 28.viii. (L.W.G.). Corbridge, ix. (J.H.H.). Charlbury, 15.xi. (H. Scott).

R. obliterata McL.—Chesterholm, 1.ix. (A.D.G.). Corbridge, ix. (J.H.H.).

Glossosoma vernale (Pict.).—Dunster, 11.viii.; Roadwater, 19.viii.; Hexham, 30.viii. (A.D.G.). Bampton, 19.viii. (L.W.G.).

Agapetus fuscipes Curt. — Hitchin, 20.vi.; Withycombe, 2, 9.viii.; Williton, 18.viii.; Roadwater, 19.viii. (A.D.G.). Bicknoller, 6.viii.; Luccombe, 20.viii. (L.W.G.).

A. comatus (Pict.).—Dunster, 16.viii.; Leebotswood, 23.viii. (L.W.G.).

A. delicatulus McL. — Washford, 2, 5.viii.; Simonsbath, 13.viii. (L.W.G.). Dunster, 7.viii.; Cutthorne, 13.viii.; Ludlow, 23.viii. (A.D.G.). Dunning, vii. (O.G.).

HYDROPTILIDAE.

Agraylea multipunctata Curt.—Woodstock, 13.ix. (A.D.G.).

Hydroptila sparsa Curt. — Deddington, 1.vi.; Stonebridge, 5.ix.; Oxford, 17.ix.; Barrington, 24.ix. (L.W.G.). Thame, 31.v.; Burford, 15.vi.; Chollerford, 30.viii.; Woodstock, 13.ix. (A.D.G.).

H. maclachlani Klap. — Southwell, 17.vii.; Oxford, 17.ix. (L.W.G.).

H. forcipata Etn.—Chollerford, 30.viii. (A.D.G.).

H. angulata Mosely. — Chollerford and Hexham, 30.viii. (A.D.G.).

Oxyethira costalis (Curt.).—Woodstock, 13.ix. (A.D.G.).

O. falcata Mort.—Barrington, 21.ix. (L.W.G.).

Ithytrichia lamellaris Etn. — Burford, 15.vi.; Chollerford, 30.viii. (A.D.G.). Hexham, 30.viii. (L.W.G., A.D.G.).

Orthotrichia tetensii Kolbe.—Woodstock, 15.ix. (A.D.G.).

D. E. KIMMINS
(*Dept. of Entomology, British Museum, N.H.*).

Notes on a spider parasite, believed to be Colpomeria quadrisculpta Gr. (Hym., Ichn.).

By sweeping birches in Knighton Heath Wood, Dorset, on 9th May, 1936, three specimens of *Epeira curcubitina* were obtained, each carrying a larval parasite.

Each grub was fixed by its anal end to the spider's abdomen, between it and the cephalothorax, the head end coming round to the top left side, where it apparently pierces the skin and sucks the juices of the spider.

One specimen was accidentally crushed, but one was successfully reared. The spider was found dead on 16th May, and the grub quickly consumed all but the hard parts, this draining process taking about a day. The grub was then about $\frac{3}{8}$ in. long and $\frac{3}{32}$ in. wide. It spun a light cocoon. The change to the pupa was very gradual, but on the 23rd the shape of the head, thorax and abdomen and legs could be distinguished. Then various portions turned lead-colour and finally black. The tarsi and wings were the first parts to turn dark. On 6th June the pupa had become more generally pigmented, but the underside of the abdomen was still a cloudy-white, the femora and tibiae being reddish-brown. As far as could be seen through the cocoon, legs, wings and antennae were quite free. Throughout its development the extremity of the abdomen was much curved, and this is a feature of the perfect insect. During its metamorphosis it was very active in revolving inside its cocoon if disturbed in the slightest way. The perfect ichneumon emerged on 7th June.

The fate of the other specimen was different. On 14th May the spider cast its skin, but this did not dislodge the grub, only causing it to change its position so that it hung centrally down the spider's abdomen. It soon resumed its normal position. On 20th May the spider was still quite active and did not show any discomfort, although the grub was increasing in size. On the 22nd the spider died. This may have been caused by the pressure of a cover glass during microscopic examination on the previous evening.

I assumed the spider was dead, but it is possible it had become paralysed. The grub did not appear to be full grown, so fearing it might die I carefully removed it with a small portion of the spider's skin, and confined it in a very small tube with another spider of the same species, hoping it would attach itself to a new host. After a couple of hours with no result I gave it up as a bad job and preserved it instead.

I am indebted to Mr. G. J. Kerrich for naming the specimen as to genus (*Colpomeria*). The specific name—*quadrisculpta*—is not definitely settled.

A. L. Capener.

Volucella zonaria Poda (Dipt., Syrph.): A tantalising find.

Some little time back Mr. S. R. Ashby, the Hon. Curator of the South London Entomological Society, lent me for inspection a store-box of Diptera taken by the late Mr. W. West, well known to the older generation of entomologists as a coleopterist and hemipterist and for many years Hon. Curator of the above-named Society. In this box, with other Syrphidae, was a nice specimen of *Volucella zonaria* Poda, unfortunately without data. This specimen, a male in good condition, is set

low down on a white pin in exactly the same way as the other flies in the box, and as Mr. Ashby tells me that Mr. West, whom he knew intimately, never collected abroad and that he paid regular collecting visits to the New Forest in Mr. Ashby's company from 1904 to 1915 I think it can be considered highly probable, at least, that this is a British specimen taken in that locality.

Of other British records there is one fully authenticated, *viz.* a female taken in the New Forest, 11.viii.1908, by the late Dr. Sharp and now in the Cambridge Museum (Dr. Hugh Scott, 1923, *Ent. mon. Mag.*, **59**: 260). In this note Dr. Scott refers to two specimens mentioned by G. H. Verrall, 1901, British Flies, **8**: 671, under 'Reputed British Species.' These too were said to have been taken in the New Forest and were in the Entomological Club collection, but subsequently removed on grounds of insufficient evidence of British origin. Dr. F. H. Haines has also recorded in 1932, *J. Ent. Soc. S. of E.*, **1** (2): 39, a female specimen probably taken by him as a boy in the neighbourhood of Edenbridge, Kent. Apart from these I know of no other records of the occurrence of this large and conspicuous Syrphid in Britain. In his note mentioned above Dr. Scott states that *V. zonaria* is common on the Continent, and there is nothing in its life-history as an inquiline in the nests of *Vespa crabro* L. and *V. vulgaris* L. to prevent its breeding in this country.

H. W. Andrews.

On the imaginal distinctions between Acronycta psi and A. tridens Schiff.

I received some days ago from Mr. Parkinson Curtis two photos, one of *A. psi.* L. and the other of *A. tridens* Schiff., together with some remarks on their determination. He pointed out that the handle of the dagger-like mark in *psi* showed a gap between the end and the cilial spots, but that in the case of *tridens* this was not so, and asked me to examine my own series.

I find that on the whole the difference is true, and is therefore a point worth noting. Tutt, 1891, British Noctuae and their Varieties, **1**: 18, quoting Chapman, mentions the shortness of the dagger handle in *psi,* which is the same thing stated less exactly.

Tutt also mentions in his description of *tridens* the eight cilial spots on the outer margin of the forewings, but seems to have overlooked the fact that these are much less well developed in *psi* than in *tridens*. This point is fairly constant. Nos. 7 and 8, counting downwards from the apex, are close together, and of these two the upper usually coalesces with the dagger handle in *tridens,* and this gives the impression that the handle is longer in *tridens* than in *psi*. In any case, it makes a point by which

the two species can be *fairly* well determined, especially as in cases where the cilial spots are more strongly developed in *psi* than usual there is a gap between the dagger handle and No. 7. My remarks are based on the examination of twenty-eight bred specimens of *psi* and twenty-four bred specimens of *tridens*.

A. H. Sperring.

Limenitis camilla Linn. (Lep., Nymph.) on wing in October.

On 7th October, 1935, at about 1.0 p.m. in the afternoon I saw a specimen of the white admiral butterfly on the wing at Leckford, Hants. I did not capture the specimen and cannot, therefore, give the sex.

E. F. Chawner.

Obituary: Hugh Parry Jones.

Mr. Pugh Parry Jones died on 7th Feb., 1937, from pneumonia after only a few days' illness. He was in his forty-fourth year, having been born on 11th July, 1893, at Cambridge, where his father was in practice as a solicitor. He was educated at the Perse School, Cambridge, but a breakdown in health prevented him from entering the University and also from serving in the war. In 1919 the family removed to Lymington and later to Brockenhurst; this effected a great improvement in Mr. Jones' health and enabled him to indulge to the full his passion for collecting insects of all orders. His favourite groups were the Hemiptera and Aculeate Hymenoptera, of which he had a very thorough knowledge. In mounting his specimens he displayed a degree of skill rarely equalled, and his extensive collections, which he presented to the Nottingham Museum, are most beautifully arranged. He was a talented artist and made a large series of coloured drawings of Aculeates which he intended to publish in a series of Monographs on the group.

In 1923 Mr. Jones was appointed assistant curator to the Nottingham Natural History Museum, and here his ability in naming and arranging the insect collections found full scope. In 1931, on the retirement of Professor Carr, he became curator.

Mr. Jones' published work included a guide to the Museum, a 'List of the Aculeate Hymenoptera of Hampshire and the Isle of Wight,' and 'An Account of the Hemiptera-Heteroptera of Hampshire and the Isle of Wight with additional notes on British species not recorded for the County.' This valuable work, which is illustrated by two structural plates, is really a full synopsis of the British genera and species of Heteroptera. Only a month before his death he published an account of a new British species of 'Mason wasp' (*Microdynerus exilis* H.-S.), which he redescribed in detail. He had made extensive notes for a monograph on the Odyneri, and had he lived he would

doubtless have made important contributions to our knowledge of the British Aculeates. It is a sad pity that his critical knowledge of these insects cannot now be made available to his fellow-workers.

Mr. Jones married a daughter of Mr. W. A. B. Ferris of Brockenhurst and granddaughter of Canon Ferris of Nottingham. She and a son survive him, and the sympathy of all entomologists will go out to them in their bereavement.

J. W. Carr.

Arctia plantaginis Linn. (Lep.) eaten by Swifts.

Mr. T. W. Kirkpatrick, of the Agricultural Research Station, Amani, East Africa, recently sent me the following observation, through Dr. C. B. Williams, of Rothamsted, to whom I am greatly obliged:

> 'On June 26, 1937, I was on Wetherlam, near Coniston, about 2,000 ft., and for half-an-hour sat watching swifts catching *Arctia plantaginis*. The moths were very common, but not flying much, but when they did a swift was after one at once and usually got it. There were very few other large insects about, except a few 'Small Heaths' and a brown butterfly I had not seen before, *Erebia epiphron* Knoch, I think. I did not see either of these attacked.'

This observation seemed to me sufficiently interesting to be worth enquiry, and I wrote to Mr. Kirkpatrick, who kindly gave the following information:

> 'The moth was common or abundant in most suitable places between about 1,000 to 2,300 feet during June 20th-29th. I don't know if this is so in all years. Time of day, about 2.30-3.0 p.m. (summer time). Bright sun, almost cloudless. Temperature probably not much over 60° F., but felt warmer. Wind S.W., rather fitful, say 5-15 m.p.h. I *think* the moths were only flying much when an extra strong gust (or someone walking through the grass) disturbed them. The ground was very broken, so that a few yards from starting a flight a moth might be many feet up in the air without actually having flown upwards. The butterflies mentioned were flying in the same way, but I should estimate there was only one of them to about ten *plantaginis*. The swifts were catching them at all levels between one and at least fifteen feet from the ground. My impression is that they more often missed the ones close to the ground.
>
> 'Although *plantaginis* was more or less all over the place I did not see swifts catching them (or anything else) anywhere else in the hills. There were about seven or

eight swifts but they were making wide sweeps and it was difficult to be quite sure of the number.'

This seems to be a case of the provision of an abundant article of food at a particular spot favouring its capture. It is, therefore, hardly surprising that the swifts, probably with young to feed, should have made the most of it.

G. D. Hale Carpenter.

Tits feeding upon Butterflies.

Mr. F. Dowsett has sent me the following interesting note: 'Close to where I sit at work is a radiator, behind which a pair of Great Tits have nested. They obtain entrance by means of a grating on the outside wall. Last week I happened to glance out of the window and saw one of the birds with a *Pieris* in its beak. I was very interested. The rest of the week I glanced up from my work occasionally with the following results. On May 26th I saw them take 12 specimens to the nest, on the 27th they took 11, on the 28th I noticed 15 (5 of these in about ten minutes), and on the 29th I counted 14 during the morning only. In addition, they took many larvae. Before going to the nest they invariably perched on a Buddleia for a few seconds, so I got a good view. In every instance the whole specimen was taken, and although I searched for wings I was unable to find a trace of one. As far as I could tell, the insects were *Pieris brassicae* L. and *P. rapae* L. I noticed that the insects were held by the body with the wings closed, from which I had the impression they were taken while at rest. There were plenty of *Pieris* about, but the birds made no attempt to take them in flight.'

After the young had flown Mr. Dowsett removed the grating, but found no wings in the nest: presumably they had been removed by the parents or, less probably, the whole insect had been swallowed.

In this connection an old observation may be quoted, for which I am indebted to Mr. W. B. Alexander.

E. Jesse, in 1835, 'Gleanings in Natural History,' London, 3rd series, p. 94, wrote: 'Tom-tits catch and feed upon the early butterflies. They lay hold of them as I have often observed with their feet.'

G. D. Hale Carpenter.

Insects attracted to Light?

My attention has recently been drawn to two instances of the probable attraction to light of two species of insects.

Firstly the common earwig *Forficula auricularia* Linn. was noted under the following circumstances. At one point close to the fence of my garden in Leeds is a street lamp. On several

evenings in September when passing through my gate after dark and glancing along the top of the wooden fence, one or two earwigs were noticed on the top of those posts nearest the light thrown down by the lamp. On the first few occasions when the observation was casually made this circumstance was not considered unusual. One night, however, a close search was made of the whole fence to obtain a rough indication of the number of earwigs present. It was thus found that the only earwigs present were some three or four examples on the top of a few posts nearest to the light. For the fortnight comprising the last week in September and the first in October a few examples could always be found at night on the top of the posts nearest to the light and nowhere else. They were not present on the fence at all during the daytime, although odd examples were noticed in other parts of the garden. It is suggested as a reasonable probability that these insects climbed each night into the positions described due to their attraction to the light. During the fortnight mentioned the weather was mild and dry. The earwigs disappeared when cooler weather set in.

The second instance was communicated by Mr. Harold Walker, of Leeds, who submitted a damaged specimen of *Dytiscus marginalis* Linn., ♀, which he picked up from a footpath in Leeds on September 23rd. The beetle was dead but in a fresh condition, evidently recently trodden upon, and was lying close to the foot of a lighted street lamp. It was picked up late in the evening after dark. Well known as a night flier, this example of *D. marginalis* was probably attracted to the lighted lamp, and on falling to the ground was crushed by a passer-by.

JOHN R. DIBB.

Cornish Coleoptera.

A small collection of insects made by Mrs. C. C. Murray in West Looe, Cornwall, and its environs, during August, 1934, has recently been examined and the following Coleoptera are included:—

Carabus violaceus Linn., var. *sollicitans* Hamp. One example somewhat unusual owing to its very narrow form and under average size.

Trechus quadristriatus Schr.

Lionychus quadrillum Duft. A single specimen of this rare coastal species of the Lebiinae.

Chrysomela orichalcea Müll.

Chrysomela banksi Fab. A fine specimen of brilliant metallic violet coloration.

Timarcha tenebricosa Fab. Abundant.

Oedemera nobilis Scop.
Lagria hirta Linn.
Otiorrhynchus sulcatus Fab. Abundant.

JOHN R. DIBB.

Some Records of the Narcissus Fly Merodon equestris Fabr. (Dipt., Syrphidae).

In view of the economic importance of records of the distribution of this pest the following may be of interest.

Five specimens were taken by me in a garden at Gilling, near Richmond, Yorks, in May, 1923. Three were of the fulvous form var. *narcissi* Fabr. and two of the darker type form *equestris* Fabr. The gardener informed me that Dutch bulbs had been recently purchased.

Two specimens were brought me by a friend which had been taken in June, 1934, in a garden in Richmond, Yorks, but they were too rubbed for reference to a particular form.

I believe that numbers of Dutch bulbs have been imported for the many new houses that have been erected in the Richmond district in recent years, and that the Narcissus fly is fairly numerous there in consequence.

T. P. LEVETT.

Agrotis simulans Hufn. (Lep.) in Wiltshire.

This local species was taken at Chute in August, 1935.

W. L. FREER.

Sphingidae (Lep.) at Barrow-on-Soar, Leics.

The following records of captures of different species of Sphingidae during the last two years may be of interest.

Dilina tiliae Linn. was taken in the larval stage in 1935 and successfully reared, emerging on 5th May, 1936. An imago was taken on 6th June, 1937. As far as can be ascertained, these are the first records for this locality.

Chaerocampa elpenor Linn. was taken on 2nd July, 1936, and *Smerinthus ocellata* Linn. on 22nd May, 1937, but both these species have been recorded previously in this locality.

C. J. TATHAM.

A note on some parasites of Zygaena (Lep.): Addendum.

Two males and two females of *Mesostenus subovalis* Thoms., a well-known Ichneumonid parasite of *Zygaena,* emerged from the Cornish cocoons of *Z. filipendulae* L., recorded in 1937, *J. Soc. Brit. Ent.,* **1** (7): 176-8, but were unfortunately omitted from the published accounts.

G. D. HALE CARPENTER.

On the occurrence of Nematodes in Corixa geoffroyi Leach (Hemiptera, Corixidae).

On the 3rd September of this year (1937), twenty-three specimens of *Corixa geoffroyi* Leach, of both sexes, were collected from a pond in the north of the New Forest. One of the females was found to harbour a Nematode worm, which could be plainly seen through the ventral cuticle of the abdomen as whitish coils. The insect was kept alive for two days, in the hope that the parasite might emerge, but as this did not happen, the Corixid was killed and dissected.

The dissection was performed under dilute formalin. As soon as an attempt was made to remove the wings, the head and prothorax suddenly separated from the rest of the body and the worm burst its way out of the aperture in the mesothorax; the parasite was probably exerting considerable pressure within its host. The contents of the thorax and abdomen were then exposed, care being taken not to disturb the position of the worm. More than half the length of the Nematode was coiled up anteriorly outside the body of the insect, and it would appear that the thorax must have housed the greater part of the parasite. The abdominal cavity was almost completely occupied by the worm, which was coiled over and below the alimentary canal.

H. Weber (1930, Biologie der Hemipteren: 469) mentions a case of Nematodes parasitising the Cercopid, *Aphrophora salacis,* and states that there was an obvious reduction of the sex organs. An examination of the infested Corixid for signs of a similar parasitic castration showed that the ovaries were small, the right being slightly larger than the left, and having immature oocytes somewhat larger than those of the left. Whether parasitic castration was also effected in this Corixid is problematical owing to the immaturity of the host.

Further examination of the internal anatomy of the Corixid showed that the position of the alimentary canal was normal. The fat body, however, was much reduced in size, there being only a few scattered masses of yellow fat tissue.

Dissections of two uninfested female *C. geoffroyi* from the same collection were performed for comparison with the parasitised specimen. In all three insects the ovaries were of approximately the same size. Fully developed ovaries, however, were found in a few females of another species, *Sigara hieroglyphica* Duf., also taken in the collection. The latter insects must have been of last year's generation, while those with immature ovaries were of this year's generation. The uninfested *C. geoffroyi* differed from the parasitised female in possessing well developed fat bodies which packed in tightly the contents of the abdominal cavities.

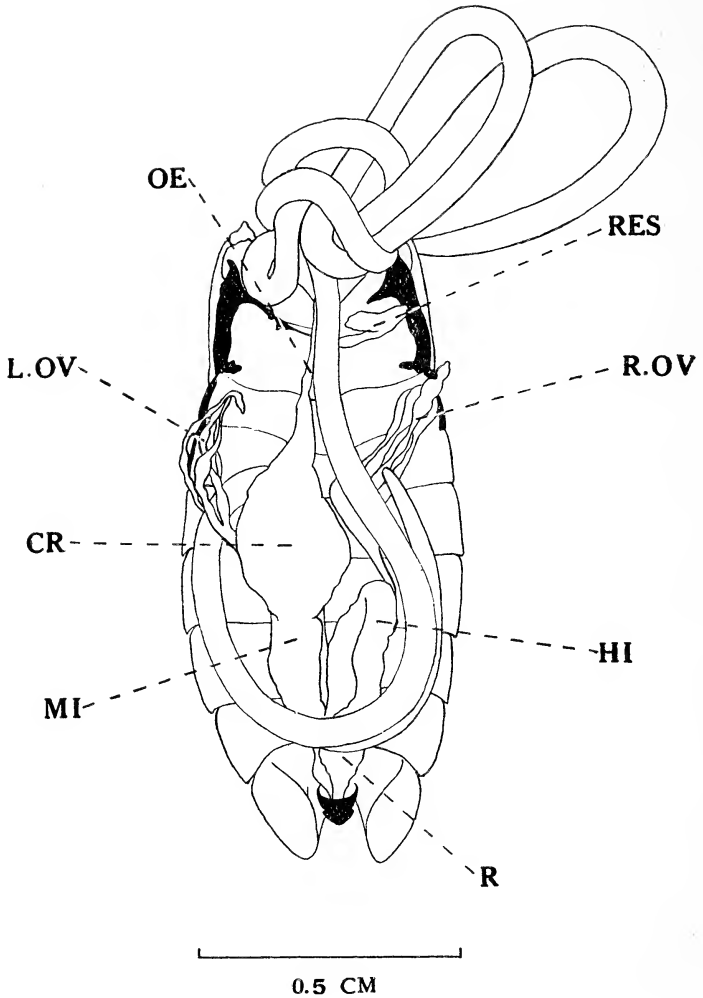


FIG. 16.—*Corixa geoffroyi* Leach. Dissection of a female specimen, showing position of its parasite.

CR—Crop; HI—Hind-intestine; L.OV—Left ovary; MI—Mid-intestine; OE—Oesophagus; R—Rectum; RES—Reservoir of stink apparatus; R.OV—Right ovary.

In June, Corixid nymphs had been collected from another pond, about a mile distant from the first. Some of these nymphs, which, from their large size and from the fact that this pond always supports a large population of *C. geoffroyi,* are believed

to be of this same species, were found to be infested with Nematodes. On being taken back to the laboratory in tubes containing water, it was found that many of the worms had emerged from their hosts through large holes made dorsally in the thorax. Each nymph possessed only one parasite. The worms were kept alive in water and mud in shallow dishes, but all died within a few days. The Nematodes were of smaller size than that found in the adult Corixid, and their lengths seemed to be correlated with those of their hosts.

The Nematodes were submitted to Dr. H. A. Baylis, of the British Museum (Natural History), who very kindly examined them and placed them in the genus *Mermis* (Fam. Mermithidae), but owing to their immaturity it was impossible to name them.

Cases of parasitism of insects by Nematodes are common, but there is apparently only one instance of their parasiting Corixids, for which record I am grateful to Dr. Baylis. R. Ball (1846, *Ann. Mag. Nat. Hist.*, **17**: 135) speaks of a '*Gordius* or *Filaria*' occurring in a specimen of '*Corixa striata*.' This author is quoted by C. T. von Siebold (1850, *Stettin. Ent. Ztg.*, **11**: 336), and again by C. M. Diesing (1851, Systema Helminthum, **2**: 100). Dr. Baylis says that in those days the Gordiids and Mermithids were much confused, so that it is very likely that the Nematodes here mentioned are identical with that of Ball.

I am much indebted to Mr. F. J. Killington for his kind assistance in the writing of this note, and to the authorities of the British Museum (Natural History) for their help in obtaining the references.

C. J. Banks

(*Dept. of Zoology, University College, Southampton*).

Peronea hastiana Linn. ab. nov. postmaculana (Lep.).

Some time ago Mr. H. L. Andrews submitted to me a *Peronea* that he had taken upon a honeycomb at Chamberlayne's, near Bere Regis, Dorset. I referred it to *P. hastiana* Linn., but as it presented certain reddish scales more akin to *mixtana* Hb., I decided to dissect it. I found that the socii agreed with *maccana* Tr. (Pierce and Metcalfe, 1922, Genitalia of British Tortricidae, Pl. viii), the cornuti were four in number and that the aedeagus had a thorn (Pierce and Metcalfe, *l.c.*, p. 22). The range of *P. maccana* is too restricted to permit satisfaction with that, and I still had a feeling that *hastiana* Linn. was the correct specific name. I accordingly availed myself of Mr. W. G. Sheldon's well-known kindness, and he at once confirmed my identification as *hastiana*, and pointed out that there was confusion in Pierce and Metcalfe over the *Peronea* group, a matter that they have put right in their recent volume on the British Tineina.

I suggested to Mr. Sheldon that if this aberration had not received a name it would be wise to name it *postmaculana*. Mr. Sheldon agrees that the name is suitable, but questions the propriety of raising the name on the basis of a single specimen, and from his letters he agrees, it seems, with a view I hold that the naming of aberrations not known to recur with some degree of regularity is an undesirable practice.

After giving the matter a good deal of thought I am in this instance abandoning the view on this ground. The whole of the descriptions I have so far read do not call attention to the possibility of a spotted hindwing in this genus. That such a thing has occurred is a fact that in my view should be emphasised, but directly this is done someone will erect a name and possibly an unsuitable one. I have, therefore, decided to bring forward the name *postmaculana* and ensure that the name shall convey to the reader of it the salient particular on which the name is founded, and call his attention to the fact that the level tone of hindwing, so prevalent in the genus *Peronea*, is not an immutable character.

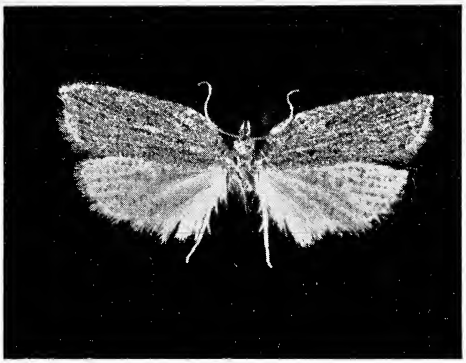
DESCRIPTION OF *POSTMACULANA* ab. nov.

The type which bears my label is the above-mentioned ♂ specimen.

The salient character on which the aberrational name is based is the spotting of the hindwings, and the name might be extended with or without an addition of some other aberrational name to any specimen with spotted hindwings. The general hue of the specimen is dark greyish-brown (Ridgway, Pl. XLV) with No. 1 blackish-brown (Pl. XLV) dots and venation, with hindwings very light drab (Pl. XLVI). Examination under a lens shows that this hue is due to colour confusion, and in fact the forewings are pale violet-grey (Pl. LII) thickly vermiculated with fuscous (Pl. XLVI). There is a strong semation of scales of a pompeian red (Pl. XIII), the red scales occupy almost the whole basal portion of the dorsum and distally being more numerous on the nervures and tending to gather themselves into dots in a series following the courses of the postmedial and subterminal lines; those on veins 1, 2 and 3 in the subterminal region, having black scales, almost present the appearance of tiny black centred eye spots. There is a strongly marked black spot in the submedian fold at about a quarter of the length of the wing from the base, and one on the submedian, and a faintish pair to that on the submedian on the median nervure not quite the full distance of the cell from the base of the wing. There are a number of black scales or blackish brown scales scattered over the wing and these tend to congregate below the nervures in the interneural spaces, giving the appearance of a blackish veined wing.

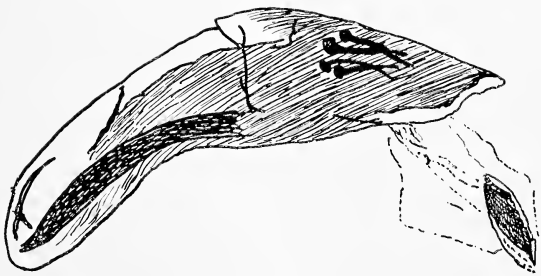
PLATE V

A



B

C



Peronea hastiana Linn. ab. nov. *postmaculana*.

A—Type of ab. *postmaculana*. *B*—Genitalia of ab. *postmaculana*. *C*—Penis of ab. *postmaculana* to show typical cornuli.

The hindwings are really of three colours, the lightest general tone an exceedingly pale drab, strongly mixed with light drab, and every interneural space has a regular row of hair-brown spots (Pl. XLVI) throughout its length. These spots tend to widen as the termen is approached. The three outer spots are so placed that they appear to be arranged in three concentric rows parallel to the termen. The cell is occupied by a double row of spots, the lower row being immediately below the spaces between the upper row of spots, and not below the actual spots themselves; the termen is narrowly edged hair-brown, which is more pronounced apically than elsewhere.

The cilia of all four wings are of the second tone of the dark colour of the wing, with a pale basal line and a pale medial line, but those of the forewing contain a few hairs of pompeian red.

The underside of the hindwings is marked similarly to the upper side, but the underside of the forewing is generally much greyer and darker than the upperside, devoid of red, but showing very plainly a type of spotting in the interneural spaces exactly similar to that of the hindwings. The specimen is in fair order notwithstanding the date of the capture, *viz.* 19th March, 1936.

Mr. Sheldon writes that the specimen 'is one of the *striana* group nearest to what I call *substriana* but not quite identical with any of my specimens of that form. I note the maculations on the hindwings which are very pronounced, more so than any of mine, but I have specimens, especially amongst those of the *striana* group, that have maculated hindwings.'

W. Parkinson Curtis.

Some records of bred Tachinidae (Diptera).

Dr. W. R. Thompson, in a comprehensive account of the Tachinid parasites of woodlice (1934, *Parasitology*, **26**: 378-448, pls. 15-22), recorded six species attacking *Porcellio scaber* Latr. My own attempts to rear some of these interesting parasites during the past two years have resulted in breeding two of them, viz. *Euplesina maculata* Fall. and *Melanophora roralis* L.

I am much indebted to Professor G. D. Hale Carpenter for permission to publish records of specimens in the University Collection, and to Mr. E. W. Aubrook for assistance in the collection of material.

Four colonies of woodlice obtained between December, 1935, and February, 1936, were kept in large tin boxes in the laboratory at the usual room temperature of 55° to 60° F. They were fed upon sliced potatoes and were occasionally sprinkled with water to maintain the necessary humidity. The material was examined daily, and all parasite pupae removed and placed separately in corked tubes. It was impossible to determine

which individuals were parasitised and which were not, until they died, when the puparium of the Tachinid showed clearly, entirely filling the body-cavity of the host.

The first parasite emerged on February 1st, 1936, others following at intervals until April 28th. The majority were *Melanophora roralis* L., but three *Euplesina maculata* Fall. were also bred. The pupation period of both species was about twenty-one days. Unfortunately the population density of the various colonies of woodlice was not estimated, and thus the percentage of parasitisation cannot be given. Thompson, however, states (p. 381) that 'the proportion of woodlice attacked by all the species taken together seldom exceeds five per cent. and is usually below that figure.'

Details of the material studied are given below :—

Colony A. A pure population of *Porcellio scaber* Latr. from beneath the bark of a fallen elm at Water Eaton, Oxon, 8.xii. 1935, E. Taylor. Nine *M. roralis* bred.

Colony B. A large colony of *P. scaber* from beneath elm bark at Marston, Oxon, 15.i.1936, E. W. Aubrook. Two *E. maculata* and thirty-three *M. roralis* bred.

Colony C. A mixed colony of *Oniscus asellus* L. and *P. scaber* under elm bark at Barton, nr. Headington, Oxon, 9.ii. 1936, E. Taylor. Two *M. roralis* bred from *P. scaber*.

Colony D. A small colony of *P. scaber* under bark at Tubney, Berks, 8.ii.1936, E. W. Aubrook. One *E. maculata* and two *M. roralis* bred.

An examination of the British Tachinidae in the Oxford University Museum resulted in the following records of species bred from known hosts. A small f. before a date indicates the date on which the parasitised host was collected; em. indicates the date of emergence.

Agria mamillata Pand. from *Hyponomeuta cognatella* Hübn. (Hyponomeutidae), Oxford, em. 12-26.v.1929.—A. H. Hamm.

Arrhinomyia cloacellae Kram. from larva of *Scardia boleti* Fabr. (Tineidae) in *Trametes gibbosa* Fr., Windsor Forest, Berks, em. 17.iii.1934.—H. St. J. K. Donisthorpe.

Brachycoma devia Fall. from nest of *Bombus hortorum* Linn. var. *harrisellus* Kirb. (Bombidae), Day's Lock, River Thames, Dorchester, Oxon, f. 14.vii.1911, em. 23-25.vii.1911.—A. H. Hamm.

Chaetolyga quadripustulata F. from pupa of *Cucullia verbasci* L. (Caradrinidae), Kennington, Berks, em. 17.vii.1936.—B. M. Hobby.

Compsilura concinnata Meig. from larva of *Nymphalis io* L. (Nymphalidae), Bournemouth, Hants, f. 3.vii.1917, em. 27.vii. 1917.—E. K. Pearce.

Id. from pupa of *Nonagria typhae* Thunb. (Caradrinidae), Tubney, Berks, em. Aug., 1929.—J. J. Walker.

Echinomyia grossa L. from pupa of *Eriogaster rubi* L. (Lasiocampidae), Longdown, New Forest, Hants, em. 3.vii. 1913.—F. C. Woodforde.

Ernestia rudis Fall. from *Polyploca ridens* F. (Polyplocidae), New Forest, Hants, em. 5-9.v.1913.—F. C. Woodforde.

Exorista hortulana Meig. from larva of *Acronycta alni* L. (Caradrinidae), Burnt Woods, Market Drayton, Staffs, f. viii. 1918, em. 14.vi.1919.—F. C. Woodforde.

Id. from larva of *Acronycta alni* L. (Caradrinidae), Brecknock Beacon, Brecknock, S. Wales, f. *c.* 4.ix.1920, em. 19.v. 1921.—O. Butler.

Id. from larva of *Acronycta psi* L. (Caradrinidae), St. Helens, I. of Wight, f. 25.viii.1925, em. 31.v.1926.—C. Poulton.

Exorista tritaeniata Rnd. from pupa of *Callophrys rubi* L. (Lycaenidae), nr. Stanton St. John, Oxon, f. vi.1918, em. 23.v. 1919.—J. Collins.

Miltogramma punctatum Meig. from burrow of *Colletes succincta* L. (Colletidae), Iona I., W. Scotland, f. 15.ix.1916, em. 23.vii.1917.—A. Gordon.

Nemorilla floralis Fall. from larva of *Nymphalis io* L. (Nymphalidae), St. Helens, I. of Wight, f. vi.1900, em. 20.vii.1900.—E. B. Poulton.

Parasetigena silvestris R.-D. from *Polyploca ridens* F. (Polyplocidae), New Forest, Hants, em. 5-9.v.1913.—F. C. Woodforde.

Phryxe vulgaris Fall. from larva of *Aglais urticae* L. (Nymphalidae), Cowley Marsh, Oxford, em. 27.ix.1897.—A. H. Hamm.

Id. from pupa of *A. urticae* L., Oxford, em. 7-9.vii.1898.—C. B. Sanders and E. B. Poulton.

Id. from larva of *Hadena meticulosa* L. (Caradrinidae), St. Helens, I. of Wight, f. *c.* viii.1925, em. *c.* 24.ix.1925.—J. A. Baldwin.

Ptychomyia selecta Meig. from 'evidently *Odynerus* nest in bolt hole, study door' (Vespidae), St. Helens, I. of Wight, em. 27.viii.1922.—E. B. Poulton.

Tachina larvarum L. from *Eriogaster rubi* L. (Lasiocampidae), Longdown, New Forest, Hants, em. vi.1913.—F. C. Woodforde.

Id. from larva of *E. rubi* L., nr. Falmouth, Cornwall, f. iv. 1936, em. 23.vi.1936.—G. D. H. Carpenter.

Tricholyga sorbillans Wied. from larva of *Saturnia pavonia* L. (Saturniidae), Chobham Common, Surrey, f. autumn, 1904, em. spring, 1905.—C. B. Sanders.

Id. from pupa of *S. pavonia* L., Haddon Hill, Somerset, f. 22.vii.1934, em. 1935.—E. S. Brown.

ERNEST TAYLOR

(*Hope Dept. of Entomology, University Museum, Oxford*).

Nomenclature of the Coniferae.

There appears to be a considerable amount of confusion among entomologists in regards to the nomenclature of the Coniferae.

The early botanists called the silver firs *'Abies'* and the spruce firs *'Picea.'* Linnaeus unfortunately reversed these names, and this has caused great confusion in their nomenclature.

The American and English writers still follow Linnaeus and apply the name *Abies* to the spruces and *Picea* to the silver firs, while nearly all the Continental botanists follow Bauhin and Du Roi and reverse the terms.

It will be seen from the following table that *Pinus maritima* Lamarck is a synonym of *Pinus pinaster* Aiton, while *Pinus maritima* Aiton is a synonym of *Pinus laricio* Poiret; hence it is most important that the author's name should be given when referring to the Coniferae.

Meyrick (1927, A Revised Handbook of British Lepidoptera, p. 384) gives *Picea excelsa,* the common spruce, as the food-plant of *Dioryctria splendidella* H.S., while on p. 597 he gives *Pinus abies,* which is a synonym of *Picea excelsa,* as the food-plant of *Laspeyrisia strobilella* Linn. Hence he is using two different names for the same tree.

The following is a list of members of the Coniferae of interest to entomologists :—

1. *Picea excelsa* Link. Common Norway spruce.
   Synonyms: *Abies excelsa* Link; *Abies picea* Miller; *Pinus excelsa* Lamarck; *Pinus picea* Du Roi; *Pinus abies* Linn.
2. *Pinus pinea* Linn. The Italian stone pine.
3. *Pinus pinaster* Aiton. The cluster pine.
   Synonym: *Pinus maritima* Lamarck.
4. *Pinus sylvestris* Linn. The Scotch fir.
5. *Pinus laricio* Poiret. The Corsican pine.
   Synonyms: *Pinus maritima* Aiton; *Pinus corsicana* Hort.; *Pinus austriaca* Hoss.; *Pinus nigra* Link.
6. *Larix europaea* De C. Common larch.
   Synonyms: *Abies larix* Lamarck; *Larix excelsa* Link; *Larix vulgaris* Fischer; *Larix communis* Lawson; *Pinus larix* Linn.
7. *Juniperus communis* Linn. Common juniper.
   Synonym: *Juniperus vulgaris* Bauhin.
8. *Taxus baccata* Linn. Common yew.

The above names were taken from George Gordon, 1858-62, 'The Pinetum.'

S. C. Scarsdale Brown.

The status of Gracilaria azaleella Brants (Lep., Tineina) in the British Isles.

Meyrick (A Revised Handbook of British Lepidoptera, 1927, p. 791) gives Torquay in Devonshire as the only known locality in the British Isles. This record refers to John W. Metcalfe's

note in 1926, *Entomologist,* **59**: 13. This *Gracilaria* had been found in greenhouses the previous year attached to azaleas, and had done considerable damage. Since that year *azaleella* has been reported from various parts of the country, but only in glasshouses, and not in the open.

During January, 1936, I noticed that the larvae of a species of *Gracilaria* were feeding on several shrubs of azaleas in my father's garden in Bournemouth. Some mines were collected and kept in a warm room in the house. Towards the end of March several *G. azaleella* emerged. On the 13th June the moth was quite common in the garden at sunset flying in and about the azalea bushes.

A more detailed examination of the azaleas revealed that the mines were present on most of the shrubs, and in some cases abundant enough to cause disfigurement. My father has a large collection of rhododendrons, azaleas and their hybrids, for he has specialised in their cultivation for many years. On showing him some mined leaves, he remarked that he had noticed the presence of a larvae which had damaged his plants for a considerable number of years both in his Bournemouth garden and in his old garden in Poole, Dorset.

His stock had originated by purchased plants from nurserymen in this country, by direct importation from Japan, and by seeds and grafting. Only the evergreen Japanese azaleas and their hybrids were attacked in the garden; the rhododendrons and the deciduous American species were left alone. The azalea commonly grown in greenhouses is the Indian or, as it is often called, the Ghent azalea.

It would seem that *Gracilaria azaleella* has been established in the open in this country for a considerable time, and that it will probably be found wherever azaleas are grown in any quantity. The natural home of *G. azaleella* is not known, but it has been introduced into Central Europe and North America, although not found in the open. Rhododendrons and azaleas grow principally in China and Japan, but they also occur in India and North America. It seems most probable that the natural home of *G. azaleela* is in China and Japan.

S. C. Scarsdale Brown.

The food-plant of Evetria sylvestrana Curt. (Lep.).

On the 5th May, 1936, I gathered a number of the flowering shoots of *Pinus pinaster* Aiton. I subsequently bred a large number of *Evetria sylvestrana* Curt.

Meyrick (1929, A Revised Handbook of British Lepidoptera, p. 532) gives *Pinus picea* Du Roi as the food-plant.

Pinus picea Du Roi is a scarce tree in Bournemouth, whilst *Pinus pinaster* Aiton is abundant, and as Bournemouth is the

main locality in the British Isles for *Evetria sylvestrana* Curt., I hold the opinion that the latter *Pinus* is the chief food-plant in this country.

I have never found the larvae on anything but *Pinus pinaster* Aiton, nor have I ever taken the imago away from this tree.

Wilkinson (1859, The British Tortrices) gives *Pinus sylvestris* L. and *Pinus pinea* L. as the food-plant.

S. C. Scarsdale Brown.

Strangalia quadrifasciata Linn. (Col.) in Hampshire.

Two specimens of this rare Longicorn beetle were taken on flowers of *Angelica sylvestris* Linn., in Bishopstoke Woods, Hampshire, on 25th August, 1936.

F. J. Killington.

Trichopsylla walkeri Först (Hemipt.) in Oxfordshire.

This local Homopteron was found in numbers on *Rhamnus* on the downs at Watlington on the 18th Aug., 1936.

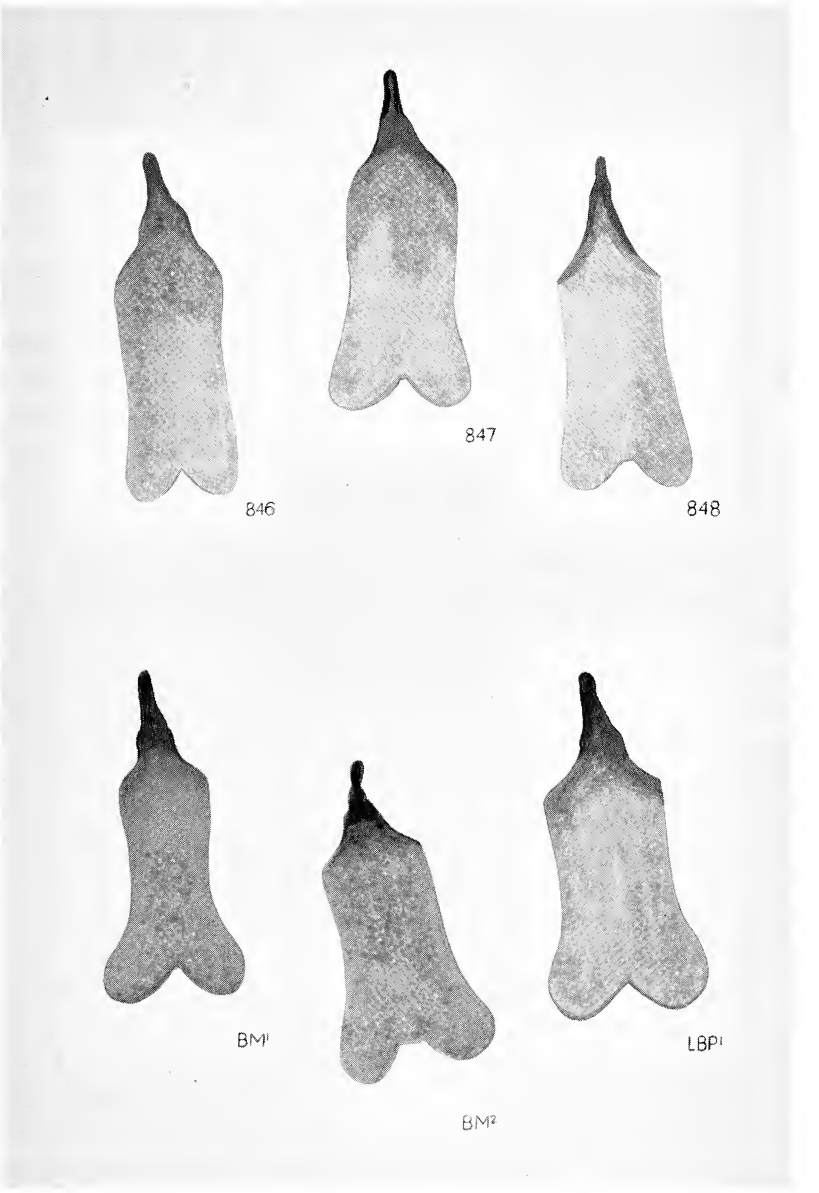
F. J. Killington.

Eupithecia distinctaria Herr.-Schäff. (Lep.).

Since the publication of my note on this species (p. 166, *ante*) through the kind offices of Mr. W. H. T. Tams and Mr. L. B. Prout, I have had the opportunity of examining and dissecting fifteen specimens of extra-British origin, eleven of which were very generously lent by Dr. Wehrli, of Basel, Switzerland.

The localities are the best that I could make of the data tickets, which presented so frequently the difficulty of being handwritten and not in printed characters and consisting of one name without as a rule any key to the country or the departmental division. When the variation of spelling in place-names is considered in conjunction with the frequent recurrence over the widest areas of the same or almost exactly similar place-names the waste of time in endeavouring to locate the locality, the uncertainty of the result attained, and the consequent wear and tear on one's temper will be appreciated.

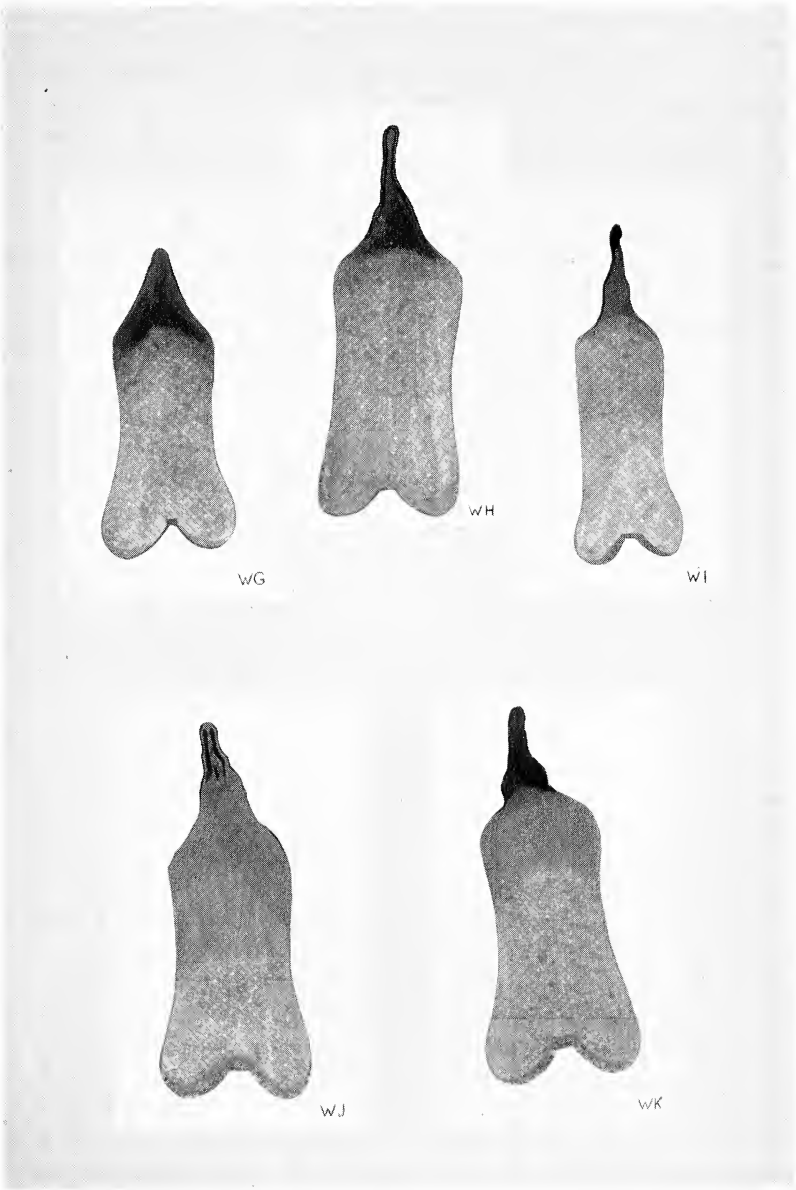
The specimens (see Plates VI, VII) are as follows: ♂, B.M.1, from Digne, Basses Alpes, France; ♂, B.M.2, e. coll. Frey, from Southern France; ♂, L.B.P.1, e. coll. Zeller, from 'Preth' quaere Pretsch in Lower Saxony; ♂, L.B.P.2 (not figured), from the Moroccan Atlas, e. coll. Joicey, was surmised by Mr. Prout to be wrongly determined and in the result Mr. Prout's view was amply confirmed so that this specimen will be ignored; a ♀, W.A., from Sierra de Alcaraz, Spain; a ♀, W.B., from Tessin (probably Switzerland, but there are several Tessins or Ticinos); a ♀, W.C., labelled Nizza, which I translate as Nice, Alpes Maritimes, France; a ♀, W.D., from Zer-



[V. Siviter Smith & Co. Ltd.

GENITAL PLATES OF *EUPITHECIA DISTINCTARIA* H.S.

846	*constrictata* Guen.,	North Cornwall, Britain.
847	*constrictata* Guen.,	North Cornwall, Britain.
848	*constrictata* Guen.,	Weymouth, Dorset, Britain.
BM¹	*distinctaria* H.S.,	Digne, Basses Alpes, France.
BM²	*distinctaria* H.S.,	e coll. Frey., Southern France.
LBP¹	*distinctaria* H.S.,	e coll. Zeller, Preth, or quaere Pretsch, Lower Saxony.



[V. Siviter Smith & Co. Ltd.

GENITAL PLATES OF *EUPITHECIA DISTINCTARIA* H.S.

WG	*sextiata*, Mill.,	Val Veletta, Sierra Nevada, Spain.
WH	*distinctaria* H.S.,	Montagna, Grande Apennines Centrale.
WI	*distinctaria* H.S.,	Schneeburg, Vienna.
WJ	*distinctaria* H.S.,	Schärtenfluh, Solothurn, Jura.
WK	*distinctaria* H.S.,	Gempen, Solothurn, Jura.

matt, Switzerland; a ♀, W.E., from Digne, B.A.; a ♀, W.F., from Digne, B.A.; a ♂, W.G., from Val Veletta, Sierra Nevada, Spain; a ♂, W.H., from Montagna, Grande Apennines Centrale; a ♂, W.I., from Schneeberg, Vienna; a ♂, W.J., from Schärtenfluh, Solothurn, Jura; a ♂, W.K., Gempen, Solothurn, Jura. (W.A. to W.F. are not figured).

The ♀♀ do not, of course, exhibit the plate, which is a purely ♂ structure, but as the sexes were mixed I examined the ♀♀ to see if they afforded any help by showing a correlated difference. The females were derived from the collections of Mr. W. Fassnidge and myself and were drawn from two French and four British localities. They afforded this amount of help. The British ♀♀ and the ♀♀ which superficially seemed to be correctly referable to *constrictata vera* presented a longish os bursa.

The ♀♀ which superficially I should have placed over the label var. *sextiata* Mill., *viz.* W.E. & W.F., both from Digne, have a short os bursa.

Of the Continental ♂♂, W.G., which has the facies I associate in my mind with *sextiata* Mill., has the blunt type of plate I figured (*ante*, p. 167) or very close to it and it is heavily chitinized. The residue of the ♂♂ exhibit a very variable plate, but despite its variability certain recurrent features. As a whole the point is strongly produced in a degree that is not present in any of the British specimens which I have examined; the shoulders of the plate are squarer than in normal British specimens, although the tendency to squareness is present in some British specimens; the chitinization is heavier in the Continental specimens than in the British and the *sextiata* type of plate is the most heavily chitinized. I was, in fact, not lucky in the British specimen I first figured, for a more extended series shows that that specimen is rather extreme. 848 is a Dorset specimen that is the most pointed specimen and the squarest that I have seen so far, and it is very lightly chitinized.

Mr. Prout tells me that he has no confident feeling that he can distinguish *sextiata* from *typica* except in extreme specimens. The inferences I draw from the rather limited material I have examined are as follows:—

There are at present no sufficient grounds for considering *distinctaria*, *constrictata* or *sextiata* as separate taxonomic units. *Constrictata* Guen. has both structurally and superficially acquired characters pointing to progress toward the formation of a British subspecies, the structural points being the lightness of the plate, the pointed plate, the shortness of the produced apex of the plate and the restriction in the squareness of the shoulders as contrasted with *distinctaria typica* and that these points are moderately stable, but the divergence is not great and certainly not as great as that of *sextiata* Mill. I should per-

haps add that the British plate seems to be rather smaller than the Continental plate in relation to the size of the insect, but I should not like to be too dogmatic on that point.

Since *sextiata* Mill. is not a form known to occur in Britain, it would be otiose to make further remark upon it in a Journal dealing only with the British archipelago.

I have drawn the figures (Plates VI and VII) all to the same scale in order to illustrate the inferences that I have drawn—those numbered 846 and 847 are both from North Cornwall and 848 is from Weymouth, Dorset. I find it desirable to work from stained specimens, and in comparing chitinization it is necessary to bear in mind the possibility of variation in the amount of staining. I stain my mounts twelve at a time in a staining trough, so that the amount of error so produced should be negligible, and since chitin will not take up stain indefinitely and only in proportion to the weight of chitin present an examination of other parts of the preparation serves as an excellent check on the amount of chitin deposited in the plate.

W. Parkinson Curtis.

Vanessa c-album Linn. (Lep.) in Norfolk.

I would like to record a specimen of the above, in perfectly fresh condition, at flowers of Michaelmas daisy, at Wendling, Norfolk, on 15th October, 1937.

The same insect was observed in the same spot on the two following days.

It is the first time I have seen this species in Norfolk.

A. H. Turner.

Additional records for two local insects: the water-beetle Hydrovatus clypealis Shp., and the water-bug Aphelauchris montondoni Horv.

I was collecting in the upper of two large pools in Richmond Park, Surrey, on 18.ix.37, and from one dip suddenly emerged five or six specimens of *Hydrovatus clypealis* Shp. Though I was working at the pool for nearly two hours and tried various spots around the edge, the *Hydrovatus* were entirely confined, so it seemed, to one small area. This is a new county record for this species. There are perhaps indications that it is becoming more widespread in its distribution over Southern England, and it is interesting to be able to record it from the London area.

On 4.x.37 I took a single immature example of the water-bug *Aphelauchris montondoni* Horv. in the R. Severn, by Castlefields, Shrewsbury, Salop. I have little doubt that if I had had more time at my disposal I could have obtained more. I believe that this is a new record for the species. E. J. Pearce.

Leptidea sinapis (Linn.) (Lep.), second brood.

Dr. F. Laidlaw informs me that a second brood of this species appeared during August, 1937, in woods around Honiton. Although he has observed this insect over many years in Devon, this is the first year that he has noticed a second brood. Specimens were taken by myself in this locality as late as the 7th June.

F. C. Fraser.

Eumicromus angulatus (Stephens) (Neur.) in the New Forest, 1937.

A number of specimens taken at Linwood, New Forest, are exhibited. Of this species Mr. Killington states that it is very rare in Britain, and has never been taken in numbers. In the light of this present experience it would perhaps be better to say that it is very local.

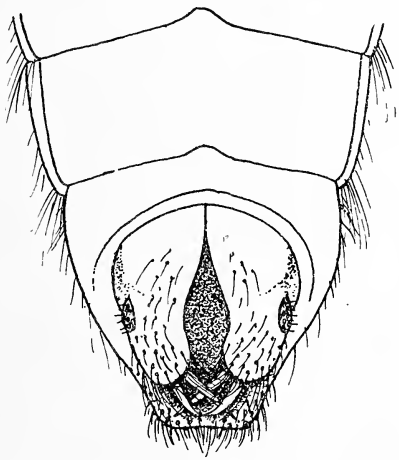


Fig. 17.—*E. angulatus* ♂. Dorsal view of genitalia.

Dr. Haines and myself in searching over his small estate at Linwood have taken no less than twelve specimens, one in 1935 and eleven this year. Of these, seven were taken in a space of a few square yards, five actually from one small birch. Although beating was carried out in the morning and afternoon, no specimens were taken until after four o'clock in the evening, so that it would appear that this insect hides up in low vegetation during the day and ascends into the bushes and trees towards night. This was put to the test in the case of the small birch mentioned above. After obtaining five specimens from it and thoroughly beating and sweeping it, it was beaten again less

than one hour later, when another specimen was secured. All specimens so far taken are males. This disparity between the sexes may perhaps be explained by the females keeping to the cover until after dark.

A figure of the male genitalia drawn from a fresh specimen is given (Fig. 17).

F. C. Fraser.

Breeding Records of Diptera, 1937.

Notes on the breeding habits of Diptera are always useful, if only for the purpose of confirming previous observations. The following notes were made this year:—

Phytomyza flavicornis Fln. Pupae in nettle stems close to root, January. Bred several times.

Chilosia grossa Fln. Two females emerged 9th and 10th April from pupae in thistle roots taken in March.

Chrysogaster hirtella Lw. One male bred from pupa in roots of grass growing in wet mud by edge of stream, 17th April. Emerged 10th May.

Mycetobia pallipes Mg. Three females bred from starling's nest, 31st May.

Limosina claviventris Strobl. About a dozen bred from the same starling's nest, May-June.

Dictenidia bimaculata L. Two females bred in June from rotten birch branch collected in Sept., 1936. Previously bred from rotten birch.

Plastosciara pictiventris Kieff. Three males, four females, bred from rotten birch. Emerged 11th May. Pupae under bark.

Oecothea praecox Lw. Though not actually bred, this fly has been taken consistently in rabbit burrows on the sand dunes of the Cardigan Bay coast in July and August, and no doubt breeds there.

Chrysonotus bipunctatus Lw. One female bred from hotbed, September, not necessarily from the horse manure, but possibly from the top covering of humus.

Acanthiptera inanis Fln. Two female imagines taken in débris of wasp's nest.

Clusio flava Mg. Taken round rotten tree stumps. Bred in other years, the flies emerging in May.

C. H. Wallace Pugh.

Agdistis staticis Millière (Lep., Pterophoridae) taken in Cornwall by Dr. C. H. Andrewes, M.D., F.R.E.S.

On 21st August, 1937, I captured a pair of plume moths *in coitu* at Aire Point, about two miles north-east of Land's End, Cornwall. They were sitting on dry grass near a patch of *Statice binervosa* (G. E. Smith) on the cliff. This patch was

less than a hundred yards long and was the only *Statice* I saw on my month's holiday in that neighbourhood. Thinking that the plumes might be something unusual, I visited the spot on two other occasions and on 30th August I took another specimen on the *Statice* patch. The wings of the plume-moths were held forward almost in line with the body. This made them more difficult to see on dry grass than is the case with other plumes.

The insects have kindly been identified by Mr. Tams of the Natural History Museum as *Agdistis staticis* Mill.

[This plume-moth was first recorded from Portland, described by Tutt as *A. benneti* Curt., var. *portlandica,* but recognised as a distinct species by Meyrick, who described it as *clivicola.*[1] K. G. Blair[2] in 1929 found larvae (on *Statice binervosa* near Saunton, N. Devon), which resembled those of *A. staticis,* preserved in the National Collection. Similar larvae were found on the same plant in the following year on the cliffs near Seaton, S. Devon, near Braunton, and near Bolt Head and Hope Cove, S. Devon. Moths were bred and determined by W. H. T. Tams[3] as *A. staticis,* specimens of which from Southern France, Sicily, Dalmatia, Algeria and Tenerife exist in the B.M. Collection. *A. clivicola* from Portland is also determined by Tams to be identical with *staticis,* a conclusion with which Meyrick is in complete agreement. Dr. Andrewes is to be congratulated on his evidence of an extended range for this interesting moth.

In writing this little note I wish to thank my friends Mr. Meyrick and Mr. Tams for their kind help and Mr. Blair for his paper. EDWARD B. POULTON. *12th Nov.,* 1937.]

Syrphidae (Dipt.) in October.

A surprise visit from my friend Dr. F. W. Edwards caused me to pay an unintended visit to the Mark Ash area of the New Forest, Hants, on 17th October, 1937, in his company.

The day was sunny and mild for the time of the year, and the following species of Syrphidae were captured on the wing:—

Eristalis tenax Linn., ♀ ♀ only.
Eristalis pertinax Scop., ♀ ♀ only.
Didea fasciata Macq., both sexes.
Epistrophe balteata de Geer., both sexes.
Melanostoma scalare Fabr., ♀ ♀ only.

Of these the most interesting observation is undoubtedly that of *Didea fasciata,* which has hitherto only occurred to the

[1] 1927, Revised Handbook of Brit. Lepidopt. : 461.
[2] 1931, *Ent. Mon. Mag.,* **67** : 84-7, Pl. III.
[3] 1931, *Ibid.,* **67** : 87-8.

writer in the New Forest in single specimens spread over a number of years.

Epistrophe balteata has been recorded as late in the year as November, and is also one of the first Syrphidae to appear in early spring when warm weather draws them from hibernation.

E. Rivenhall Goffe.

Dolichopodidae (Dipt.) from Silchester Common (Berks).

The following list of the Dolichopodidae taken on Silchester Common on 11th July, 1937, during the Society's Third Annual Congress at Reading may be of some interest to other members. Three independent collections were made, but all along the banks of the same stream, and mainly in its boggy upper part.

	♂♂	♀♀
Dolichopus popularis Wied. ...	27	12
,, *wahlbergi* Zett. ...	3	2
,, *simplex* Meig. ...	—	2
,, *ungulatus* L. ...	7	—
,, *picipes* Meig. ...	3	—
,, *atratus* Meig. ...	4	—
,, *griseipennis* Stann.	2	—
,, *plumipes* Scop. ...	5	3
,, *urbanus* Meig. ...	1	—
,, *arbustorum* Stann. .	1	—
Psilopus platypterus Fabr. ...	1	11
Poecilobothrus nobilitatus L. ...	1	—
Hercostomus nigripennis Fall. .	42	30
Hypophyllus obscurellus Fall. ..	—	1
Gymnopternus aerosus Fall. ...	58	41
Chrysotus blepharosceles Kow..	—	1
,, *angulicornis* Kow. ...	1	—
,, *gramineus* Kow. ...	—	1
,, *femoratus* Zett. ...	—	1
Diaphorus oculatus Meig. ...	5	2
Argyra leucocephala Meig. ...	1	2
,, *argentina* Meig. ...	1	2
Syntormon monilis Wlk. ...	2	2
Campsicnemus curvipes Fall. ...	2	6
,, *loripes* Hal. ...	—	1
,, *pusillus* Meig. ...	—	1
Xanthochlorus tenellus Wied. ..	—	1

Most of these are quite common and widely distributed species. *Dolichopus wahlbergi* is more local and much less common than *plumipes,* which is closely resembles, but here we have the two occurring together. *D. arbustorum* is another unusual capture, especially as Verrall (1904, *Ent. mon. Mag.,* **40**: 224) says it avoids marshy districts, and is found 'on shrubs

growing on the dry banks of country lanes.' *Chrysotus anguli-cornis* was recorded by Verrall on the strength of four specimens from Lynton (Devon), while *Syntormon monilis* was 'uncommon or overlooked.' *Campsicnemus pusillus* is the rarest of the eight British species, and distinguished from all the others by its dark legs.

H. Oldroyd, L. Parmenter, C. H. Wallace Pugh.

Wild pairing of Camptogramma bilineata L. and Hemithea strigata Mull. (Lep.).

On the evening of 30th June, 1934, at about 8.45, I saw a male *C. bilineata* flying in copulation with a female *H. strigata*; the former was rather small, but the latter was a large specimen.

Ova were laid the next day and larvae hatched 9th July. After feeding slowly for some time they commenced hibernation about the middle of September. By the middle of March, 1935, they recommenced feeding on wild raspberry. They now resembled the typical *strigata* larvae with the notched head, the green ground colour variegated with brown and the usual V-shaped markings. They moved slowly and rarely, and often ate the dead dock leaves, the feeding being done at night. By the 29th May, pupation had commenced, the pupae being enclosed in a large open network of coarse threads in the leaves of the food-plant. On 24th June, moths began to emerge — all typical *strigata* in colour, markings, fringes and shape of wings. I secured two pairings between brother and sister and ova were laid 28th and 29th June. These two broods followed the usual course, the larvae resembling *strigata* as before. Moths emerged 21st June, 1936, and I was hoping that the result would give me dominants (*strigata*) and recessives (*bilineata*) in the ratio 3: 1 in accordance with Mendelian law, but I was disappointed in having *strigata* typical in all respects. I secured more pairings between the sexes of this generation, but unfortunately the larvae did not survive the winter.

It has been suggested that the female had already been fertilised by a male *strigata* before this cross with *bilineata* took place, but I am quite sure of their identity and that they were in copulation for some considerable time; I have 'pinned' both specimens for reference.

H. R. Last.

Plusia moneta Fabr. (Lep.) in Scotland.

Mr. Scarsdale Brown's note in this Journal on page 191 is interesting as showing that this immigrant has nearly completed its occupation of Great Britain, but Meyrick's statement that Cheshire is its most northerly habitat was out of date in 1927. The moth was taken in Westmorland (Arnside) in 1909 and Northumberland (Hexham) in 1924; it is widely distributed

throughout the latter county now, but the only record I have from across the border is ' Glasgow, July, 1934.'

F. C. Garrett.

Is Strongylognathus diveri Don. (Hym., Formicidae) an indigenous British Ant?

In the summer of 1936 Captain Diver found (1), while working the insect fauna of Studland Heath, a new species of ant, which at first was thought to be a variety of *Strongylognathus testaceus* Schenk, but was afterwards declared by Mr. Donisthorpe (1A) to be a new species (*Strongylognathus diveri* Don.). This ant, which is apparently directly descended (2) from the Continental *Strongylognathus testaceus* Sch., seems to have the same habits (3), being found, as is *testaceus,* in the nests of *Tetramorium caespitum* L. *S. testaceus* is, by heredity, a slave-maker, though physically incapable of defending itself, or attacking any other ant. The question arises as to how and when *S. diveri* came to Britain (4); whether it has been recently introduced, or whether it came together with the genera *Formica* L., *Myrmica* Latr., *Aconthomyops* Mayr., when they were driven south either by the gradual cooling of the climate, as suggested by Emery (5), or some other unknown factor. I consider that it is unlikely that *S. diveri* has been introduced, because the species has, as yet, been found nowhere else. Of course, there is the possibility of the species being in existence on the Continent, though as yet undiscovered. This, however, is unlikely. Presuming that *S. diveri* is directly descended (6) from *S. testaceus,* and bearing in mind the manner in which the North American varieties of *Formica rufa* L. have become differentiated from the European species since their separation from Europe by the Glacial Period, I suggest that something similar has happened to *S. testaceus* : that this ant, after having been driven to the south of England by climatic changes, was stranded there when England was separated from the Continent. Another point in favour of this suggestion is that the species *diveri* would not have had time to develop as a distinct species unless separation had taken place at least as long ago as this, for phylogenetic changes take place very slowly in ants.

With regard to the apparent scarcity and extremely local distribution of *S. diveri,* which might be construed as a point in favour of its having been introduced, I should like to point out that, to quote Dr. Julian Huxley (7), ' most of the parasitic (8) species of ants, and all those workerless (9) permanent parasites, are scarce and very local ' ; I think, therefore, that I have some justification in putting forward the theory that *S. diveri* came over with, or at the same time as, the indigenous genera *Aconthomyops, Myrmica* and *Formica.*

The point on which this theory depends is, of course, whether *S. diveri* is directly descended from *S. testaceus*. I myself think that it is, but others may not agree (9). I feel, however, that it is my duty to put forward this theory, so that, if it be definitely proved, at some future time, that *S. diveri* is descended from *S. testaceus*, then this theory, through having been preserved in print, may be noted and accepted.

NOTES AND REFERENCES.

1. DIVER, C. 1936. A new genus of ants in Britain. *Nature*, **137**: 458.
   ———— 1936. A species of ant new to Science. *Proc. Bournemouth Nat. Sci. Soc.*, **28**: 38.
1A. DONISTHORPE, H. 1936. *Strongylognathus diveri* sp.n. (Hym. Formicidae), a genus and species new to the British list, with notes on the genus. *Ent. Mon. Mag.*, **72**: 111-6.
2. It is impossible to go into this question fully here. Suffice to say that, though it cannot be proved, it is extremely likely that it is so (I definitely believe it to be so). I intend to go into the question fully in a paper on the phylogeny of ants.
3. FOREL, A. 1928. The social world of the ants. Lond. **1**: 10.
4. Climatic conditions probably confine *S. diveri* to the South of England. It has, as yet, only been discovered at Studland Heath (near Swanage and Poole, Dorset). Note also the quotation from Dr. Huxley, which I use later.
5. EMERY, C. 1895. On the origin of European and North American ants. *Nature*, **52**: 399—400.
6. See note 2.
7. HUXLEY, J. [S.]. 1935. Ants. Lond.: 98.
8. *S. testaceus* is a parasite. The exact relationship between *S. diveri* and *Tetramorium caespitum* is unknown, but it is thought to be either that of a slave-maker or a parasite.
9. There has been much disagreement concerning the phylogeny of ants. See A. Forel, *op. cit.*: 135.

B. D. W. MORLEY.

A note on a thrush feeding its young on Emperor and Tiger Moths.

The following observations are intended to be a contribution to the subject of birds attacking or eating bright coloured insects. I have been breeding Emperor Moths on a large scale for four years with the object of increasing the species on Lindow Common, Wilmslow, Cheshire. This summer I discovered an ingenious way of utilising the 'spent' specimens, males and females, by offering them to a cock thrush which has been a regular visitor to my house for three full years. It was during the nesting period and the bird was naturally occupied in finding sufficient food for four young birds. Every moth was deliberately taken from my fingers and tapped on the ground until the wings were broken off. Invariably the bird waited until it had three or four moth's bodies at a time, some being left on the ground until the others were devoid of their wings. This was a usual procedure and a daily occurrence

during the period of the emergence of my Emperor Moths. I must have used up nearly three hundred of these moths in supplying food to the thrush. With regard to Tiger Moths (*Arctia caja* L.) the bird has taken about twenty individuals and treated them in the same way. There is one point I must mention. The thrush is exceedingly tame and has been fed upon table scraps and worms for about three years. I cannot remember, however, that except in the case of the moths, any food has actually been taken from my fingers. It would appear that the moths are a tempting food for thrushes. Although I have often seen birds chasing male Emperor Moths on Lindow Common, I have not seen any of them being captured.

R. Cottam.

Tetrigidae and Acrididae (Orth.) in North Wales.

As a contribution towards completing the distribution maps of Dr. Malcolm Burr's book (British Grasshoppers and their Allies) published in 1936, I collected specimens in August, 1937, of the following species which are all common in the localities given, but are not recorded for their counties on these maps :—

Species.	Flintshire.	Denbighshire.	Merionethshire.
Tetrigidae.			
Acrydium vittatum Zett.		Maeshafn. Llansannan.	
Acrididae.			
Omocestus viridulus L.		Maeshafn. Llansannan.	
Chorthippus bicolor Charp.	Holywell. Connah's Quay.	Maeshafn. Denbigh. Llansannan.	
C. parallelus Zett.	Northop.	Maeshafn. Llansannan.	Bala.

F. D. Goodliffe.

Review: Insects of the British Woodlands. By R. Neil Chrystal, M.A., D.Sc., pp. xiii + 338. With 33 plates. Published by Frederick Warne & Co. Ltd., London. 1937. Price 7s. 6d.

This excellent book is intended primarily for the use of those who have, or are likely to have, the care and management of British forests and woodlands. It has, however, a wider appeal, and deserves the attention of all serious students of entomology.

The introductory chapter (43 pages) commences with practical hints on the use of the book, and then proceeds to deal with the biological grouping of forest insects, the classification of the insects in the animal kingdom, the external anatomy of a typical insect, insect growth and transformation, and concludes with a key to the principal types of insect larvae, a list of the orders of insects and a synopsis of the orders of importance to the forester.

The six following chapters are devoted to detailed accounts of the orders Orthoptera, Hemiptera, Dermaptera, Odonata and Neuroptera (Chapter II), Lepidoptera (Chapter III), Coleoptera (Chapters IV and V), Hymenoptera (Chapter VI) and Diptera (Chapter VII). In the case of each order, a sufficient description is given of the external anatomy of both immature and mature forms to enable students to place their captures in the right group, detailed descriptions of the more important species are given and the importance of the order to the forester and methods of control are discussed.

There are two appendices to the book: the first giving descriptions of important forest insect genera and species; the second a list of important forest insects arranged according to their biological groupings. The book concludes with a short bibliography (this might be extended to include the more important standard works on the British orders of insects in a future edition) and an index.

Mention should be made of the illustrations to the book. These comprise 205 figures (from photographs and line drawings) on 33 plates, and are of the very high standard one has come to expect from the Imperial Forestry Institute at Oxford, where the work was done.

F. J. KILLINGTON.

Review: The Dragonflies of the British Isles. By Cynthia Longfield, F.R.E.S., pp. 220. With 38 plates and numerous textfigures. Published by Frederick Warne & Co., Ltd., London. 1937. Price 7s. 6d.

This popular work by a well-known authority aims at stimulating an interest in an order of insects still somewhat neglected by the majority of field workers. Miss Longfield has been at great pains to provide every possible aid to the beginner to enable him or her to identify captures, but has avoided any reference to the more difficult structural details of the genitalia. In addition to the 38 plates (frontispiece in colour, remainder in black and white half-tone) the text is copiously illustrated with figures.

The book is divided into the following sections: glossary of terms used in the text; key to the pronunciation of Latin and Greek names; a general account of the life-history of the dragonfly; a description of methods of collecting and preserving; a table of the usual time of first appearance of the imagines; keys to the identification of species based on colours, structure and pattern; illustrated keys to the wings and body patterns of all species; descriptions of the nymphs and imagines of the British dragonflies (pp. 75-191); an account of the classification of the Odonata based on wing venation; a check list of the British species and an index.

A further attempt has been made in this book to introduce popular names, although scientific names (adopted from the Generic Names of British Insects, Part 3, published by the Royal Entomological Society of London, 1935) are also used throughout.

The book cannot fail to be of great interest and value to all entomologists, particularly as the last work on British dragonflies (imagines) was published thirty-six years ago and is now both expensive and difficult to obtain.

F. J. Killington.

Review: A List of the Lepidoptera of Hertfordshire. By Dr. Arthur H. Foster, F.R.E.S. (Transactions of the Hertfordshire Natural History Society and Field Club, 20 (4) : 157-279). 1937. Price 5s.

This list is intended to bring up to date that of the late A. E. Gibbs (1902, Vict. County Hist. Hertfordshire). The nomenclature is that of Meyrick (1928, Revised Handbook of British Lepidoptera), or, in the case of the Rhopalocera, that approved by the Committee on Generic Nomenclature of the Royal Entomological Society of London (1934).

The paper deals with the whole of the Lepidoptera, and records 1,259 of the 2,143 British species. The author has obviously been at great pains to make the list as complete as possible as regards species, but one would like to see the list more fully annotated in a future revision.

F. J. Killington.

Review: A Moth Hunter's Cossip. By P. B. M. Allen, pp. 320. With 4 plates and 2 text-figures. Published by Philip Allen & Co., Ltd., London. 1937. Price 7s. 6d.

Although this book is not intended to be a serious contribution to the science of entomology, it has been written by an experienced and careful observer of nature and contains much information of value to the active field Lepidopterist.

The subjects upon which the author gossips are obviously those in which he is most interested, and a glance at the chapter headings will best give an idea of the nature of the book: 'Hawkmoths' (Chapters I and II); 'Aspens, and some Prominents'; 'Sugar, and East Winds'; 'Light, with some Moralising'; 'A little about Assembling'; 'Various, with *fraxini* and *cossus*'; 'A Drawer-full of Rarities'; 'Something about Apparatus'; 'The Old Names, and some Latin ones.'

It is a book to inspire the young entomologist with enthusiasm, and to revive pleasant memories in the minds of the older generation. It contains much delicate and delightful humour.

F. J. Killington.

CONTENTS—CONTINUED.

PAGE

GOFFE, E. RIVENHALL: Syphidae (Dipt.) in October 231

GOODLIFFE, F. D.: Tetrigidae and Acrididae (Orth.) in North Wales 236

KILLINGTON, F. J., B.Sc., A.L.S., F.R.E.S., F.S.B.E.: *Strangalia quadrifasciata* Linn. (Col.) in Hampshire 226

———— *Trichopsylla walkeri* Först (Hemipt.) in Oxfordshire 226

KIMMINS, D. E.: British Ephemeroptera, Plecoptera and Trichoptera in 1936 202

LAST, H. R.: Wild pairing of *Camptogramma bilineata* L. and *Hemithea strigata* Mull. (Lep.) 233

LEVETT, Rev. T. P.: Some records of the Narcissus Fly *Merodon equestris* Fabr. (Dipt., Syrphidae) 216

MORLEY, B. D. W.: Is *Strongylognathus diveri* Don. (Hym., Formicidae) an indigenous British ant? 234

OLDROYD, H., PARMENTER, L., PUGH, C. H. WALLACE: Dolichopodidae (Dipt.) from Silchester Common (Berks) 232

PEARCE, E. J., M.A.: Additional records for two local insects: the water-beetle *Hydrovatus clypealis* Shp., and the water-bug *Aphelauchris montondoni* Horv. 228

POULTON, SIR EDWARD B., M.A., D.Sc., F.R.S., F.R.E.S., F.S.B.E.: *Agdistis staticis* Millière (Lep., Pterophoridae) taken in Cornwall by Dr. C. H. Andrews, M.D., F.R.E.S. 230

PUGH, C. H. WALLACE: Breeding records of Diptera, 1937 230

SPERRING, A. H.: On the imaginal distinctions between *Acronycta psi* and *A. tridens* Schiff 211

TATHAM, C. J.: Sphingidae (Lep.) at Barrow-on-Soar, Leics. 216

TAYLOR, E.: Some records of bred Tachinidae (Diptera) 221

TURNER, A. H.: *Vanessa c-album* Linn. (Lep.) in Norfolk 228

REVIEWS 236

Communications for the *Journal* should be sent to the Editor at:—

9, Bullar Road, Bitterne Park, Southampton.

SOCIETY FOR BRITISH ENTOMOLOGY

List of Publications for Sale at the Nett Prices shewn.

(All prices are post free.)

SYSTEMATIC WORKS.

British Hemiptera-Heteroptera. By H. P. Jones, 1930. 88 pp., 2 Pls. 4*s.* 6*d.*

British Neuroptera. By F. J. Killington, 1929. 36 pp., 6 Pls., 6 Figs. 4*s.* 0*d.* With Supplement (*Hemerobius*), 1934, 5*s.* 6*d.*

British Tabanidae (Dipt.). By E. R. Goffe, 1930. 71 pp., 2 Pls. 5*s.* 0*d.*

British Tipulinae (Dipt.). By H. L. F. Audcent, 1932. 35 pp., 3 Pls. 4*s.* 0*d.*

Keys to British Asilidae (Dipt.). By B. M. Hobby, 1932. 6 pp. 1*s.* 9*d.*

Meigen's 'Nouv. Class.' 1800. By E. R. Goffe, 1932. 7 pp. 1*s.* 0*d.*

British Liriopeidae (Dipt.). By H. L. F. Audcent, 1934. 12 pp., 4 Pls. 1*s.* 9*d.*

British Mecoptera (Synopsis and Feeding Habits). By B. M. Hobby and F. J. Killington, 1934. 11 pp., 2 Pls. 1*s.* 6*d.*

British Species of Dacnusa (Hym.). By G. E. J. Nixon, 1937. 88 pp., 22 Pls. 12*s.* 0*d.*

FAUNAL LISTS.

Tortrices of Hants and I.O.W. By W. Fassnidge, 1929. 20 pp. 1*s.* 6*d.*

Macro-Lepidoptera of Hants and I.O.W. By W. Fassnidge, 1925. 42 pp. 1*s.* 6*d.*

Hymenoptera Aculeata of Hants and I.O.W. By H. P. Jones, 1926. 13 pp. 1*s.* 0*d.* With Supplement, 1932, 1*s.* 6*d.*

Paraneuroptera of Hants and I.O.W. By F. J. Killington, 1926. 9 pp. 1*s.* 0*d.*

List of British Collembola. By F. A. Turk, 1933. 6 pp. 1*s.* 0*d.*

List of Dorset Lepidoptera. By W. P. Curtis. Introduction and Part I, 1934. 102 pp. annotated. 7*s.* 6*d.*

Other Faunal Lists no longer available as separates will be found in the Transactions and Journal.

GENERAL WORKS.

'Entomology and Ethics.' By W. Fassnidge (Presidential Address, 1931), 1932. 16 pp. 1*s.* 0*d.*

Bibliography of Entom. Notes in Publications of British Local Societies. (An indispensable Supplement to the Zoological Record.)
Part I, 1933. 24 pp. 2*s.* 6*d.*
Part II, 1934. 18 pp. 2*s.* 6*d.*
Part III, 1935 (The Naturalist). 67 pp. 2*s.* 6*d.*

SERIAL PUBLICATIONS.

ENT. SOC. S. ENGL.

THE JOURNAL.

Parts I–IV, 1932–33 (in all 112 pp., 1 Pl.). 2*s.* 6*d.* each.

THE TRANSACTIONS.

No. IV,	1928	4*s.* 0*d.*
No. V,	1929	7*s.* 6*d.*
No. VI,	1930 (one copy only)	10*s.* 6*d.*
Vol. VII,	Part 1, 1931 ...	7*s.* 0*d.*
Vol. VII,	Part 2, 1932 ...	10*s.* 6*d.*
Vol. VIII,	Part 1, 1932 ...	8*s.* 0*d.*
Vol. VIII,	Part 2, 1933 ...	7*s.* 0*d.*

Transactions Nos. 1—3 were issued by the Hampshire Entomological Society and are out of print. Copies, however, are sometimes available, and particulars of any on hand may be had on request.

SOC. BRIT. ENT.

THE JOURNAL.

Vol. I, Part 1, May, 1934 ...	2*s.* 6*d.*
Vol. I, Part 2, Oct., 1934 ...	2*s.* 6*d.*
Vol. I, Part 3, April, 1935 ...	2*s.* 6*d.*
Vol. I, Part 4, Oct., 1935 ...	2*s.* 6*d.*
Vol. I, Part 5, March, 1936 ...	2*s.* 6*d.*
Vol. I, Part 6, August, 1936 ...	2*s.* 6*d.*
Vol. I, Part 7, June, 1937 ...	2*s.* 6*d.*

THE TRANSACTIONS.

Vol. I, Part 1, June, 1934.	10*s.* 6*d.*
Vol. I, Part 2, Nov., 1934	12*s.* 0*d.*
Vol. II, Part 1, July, 1935.	12*s.* 0*d.*
Vol. II, Part 2, Oct., 1935.	12*s.* 0*d.*
Vol. III, Nov., 1936.	17*s.* 6*d.*
Vol. IV, Part 1, April, 1937	12*s.* 0*d.*
Vol. IV, Part 2, July, 1937	4*s.* 0*d.*

The list of Contents of any Volume will be sent on request.

The Subscription to the Society, which includes copies of all matter published during the period covered, is 21*s.* 0*d.* per annum. There is no entry fee.

Orders, accompanied by the appropriate remittance, should be addressed to **E. Rivenhall Goffe,** Hon. Sec., 102, High Street, **Southampton.**

95.70642
S06

VOL. 1. PART 9.

SMITHSONIAN INSTITUTION
APR 24 1939
NATIONAL MUSEUM

JOURNAL
OF THE
SOCIETY FOR BRITISH ENTOMOLOGY

EDITOR:
F. J. KILLINGTON, D.Sc., A.L.S., F.R.E.S., F.S.B.E.

ASSISTANT EDITOR:
B. M. HOBBY, M.A., D.PHIL., F.R.E.S.

DATE OF PUBLICATION: 12TH APRIL, 1939.
Copies may be purchased from the Secretary at 102, High Street, Southampton.
Price 2s. 6d., post free.

CONTENTS.

PAGE

BANKS, C. J., B.Sc.: A peculiar union of the legs in a nymph of *Corixa punctata* Illig. (Hemiptera, Corixidae) 252

——— Second, Third and Fourth Congresses of the Society for British Entomology 255

BECK, R.: A Chalcidid hyper-parasite on a Braconid (Hym.) 247

BRETT, G. A., B.Sc., A.R.C.S., D.I.C.: Parasites of *Cucullia verbasci* Linn. (Lep.) 241

BROWN, S. C. S., L.D.S.R.C.S.: Sexual connection between males of *Lasiocampa quercus* Linn. (Lep.) 261

——— The larval stage of *Chimabache fagella* Fabr. (Lep.) 262

——— *Orthosia suspecta* Hübn. (Lep.) in Dorset 262

CALLAN, E. McM., B.Sc., A.R.C.S., D.I.C., F.R.E.S.: Notes on the woodwasp, *Xiphydria dromedarius* F., on the cricket-bat willow 242

——— Assembling of *Thersilochus rufiventris* Brisch. (Hym., Ichneumonidae) 244

COWIN, W. S.: Manx Lepidoptera: an appeal 239

FASSNIDGE, W., M.A., F.R.E.S.: *Telphusa aethiops* Westw. (Lep.) in Hampshire 245

——— Notes on collecting cases of *Whittleia reticella* Newm. (Lep.) 246

FRASER, F. C., M.D., F.R.E.S.: A note on *Micromus variegatus* (Fabr.) (Neur.) 257

——— *Colias croceus* (Fourcroy) (Lep.) ovipositing in close confinement 258

FREER, W. L., M.A.: Unusual form of *Plusia iota* L. (Lep.) 245

GOODLIFFE, F. D., M.A.: A joint infestation of barley by *Lasiosina cinctipes* Mg., together with *Chlorops taeniopus* Mg. (Diptera, Chloropidae) and their Hymenopterous parasites . 248

——— Acridiidae (Orth.) in Worcestershire, E. Herefordshire and Shropshire, with a note on their ecology in the Malvern Hills 259

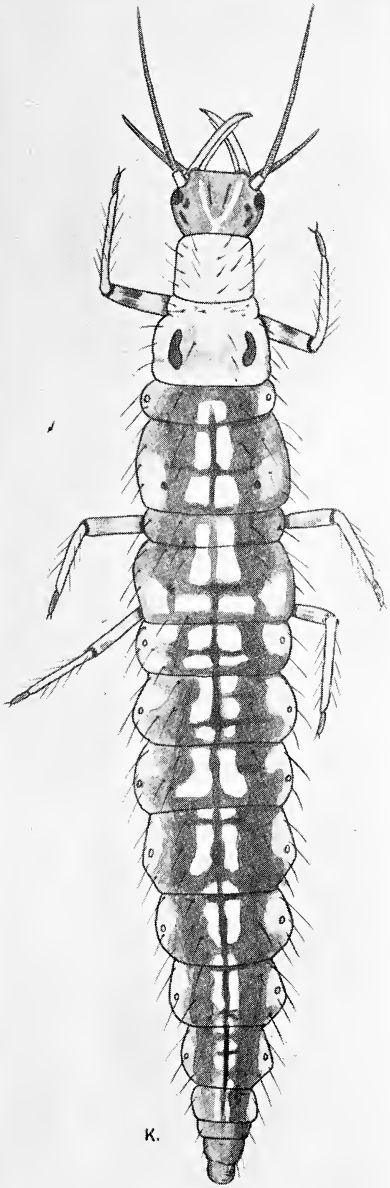
[*Continued on page 3 of cover.*]

95.70642
S66

Journal of the Society for British Entomology.
Vol. 1, Part 9.

Plate VIII of this part is enclosed to take the place of the present one, which is incorrect.

PLATE VIII.



Third instar larva of *Micromus variegatus* (Fabr.).

Pupa of *Micromus variegatus* (Fabr.).

Photo] [D.E.K.

JOURNAL OF THE SOCIETY FOR BRITISH ENTOMOLOGY

VOL. I. 12TH APRIL, 1939. PART 9.

Manx Lepidoptera: an appeal.

I am collecting particulars with regard to the occurrence and distribution of the Manx butterflies and moths, with a view to the publication of a Catalogue of Manx Lepidoptera.

Any records or unpublished notes will be welcome, especially with regard to the micro-lepidoptera. Any information will, of course, be acknowledged.

W. S. COWIN
('Kenwood,' Brunswick Road,
Douglas, Isle of Man).

Supplementary notes on the life-history of Micromus variegatus (Fab.) (Neur.).

This species is one which both Withycombe (1924) and Killington (1936) were unsuccessful in rearing beyond the second larval instar, and when Dr. K. G. Blair offered me a female which had already laid some eggs I welcomed the chance of trying to fill in some of the gaps in our knowledge of this species. I received the eggs towards the end of June and the larvae hatched in ten to twelve days. I did not observe the moult to the second instar, probably owing to the small size of the cast skins, but the second moult took place nine or ten days after hatching. The third instar lasted only four to six days and then a very slight silken cocoon was spun, through which the larva was clearly visible. The cocoons were spun, one in a coiled leaf, one under a leaf, between it and the glass tube, and one on the gauze cover of the tube.

The prepupal state lasted about six days and the pupal period seven to eight days. The larvae were provided with aphides from a species of *Epilobium* and fed readily. Mortality amongst the larvae was rather high (perhaps not much greater than in nature), and of about eighteen larvae only seven reached the last instar, three made cocoons and only two actually pupated. Several examples died after entering the prepupal stage without forming cocoons.

Third Instar Larva (Plate VIII).

Head (without mandibles) about two-thirds as long as wide, pale fuscous, with two lines on the frons and a pair of spots behind each group of eyes darker; frontal and epicranial sutures

APR 24 1939

white. Jaws a little longer than the head, pale, with golden-brown apices. Antennae brownish, about two and a half times as long as head, tapering to a fine point. Palpi brownish, a little longer than the head, rather stouter than antennae, carried in a laterally divergent position; two basal segments pale, short and stout, bearing a few bristles, terminal segment long, annulated, unarmed, apex very obliquely truncate.

Body slender, spindle-shaped, sparsely clothed with hairs. Above there is a median longitudinal pale cream stripe, bordered on each side by a broader reddish-brown band. The median stripe is much broken into spots, and is bisected by a pulsating dark reddish-purple line. The anterior part of the prothorax is almost entirely pale yellowish.

Legs yellowish, femora with obscure fuscous subapical rings and the extreme apices narrowly jet black. Tarsi fuscous.

Length about 5 mm.

Pupa (Plate VIII).

Wings, legs and antennae at first pale golden-yellow, becoming more creamy in colour with age; eyes brown, darkening to black with a metallic glint; body creamy-white, abdomen above and below with a purplish-red tinge, this colour being stronger towards the lateral margins, a lateral band of creamy-white.

References.

Killington, F. J. 1936. A Monograph of the British Neuroptera, **1**: 252-257. Ray Society, London.

Withycombe, C. L. 1924. Further notes on the biology of some British Neuroptera. *Entomologist*, **57**: 145-152.

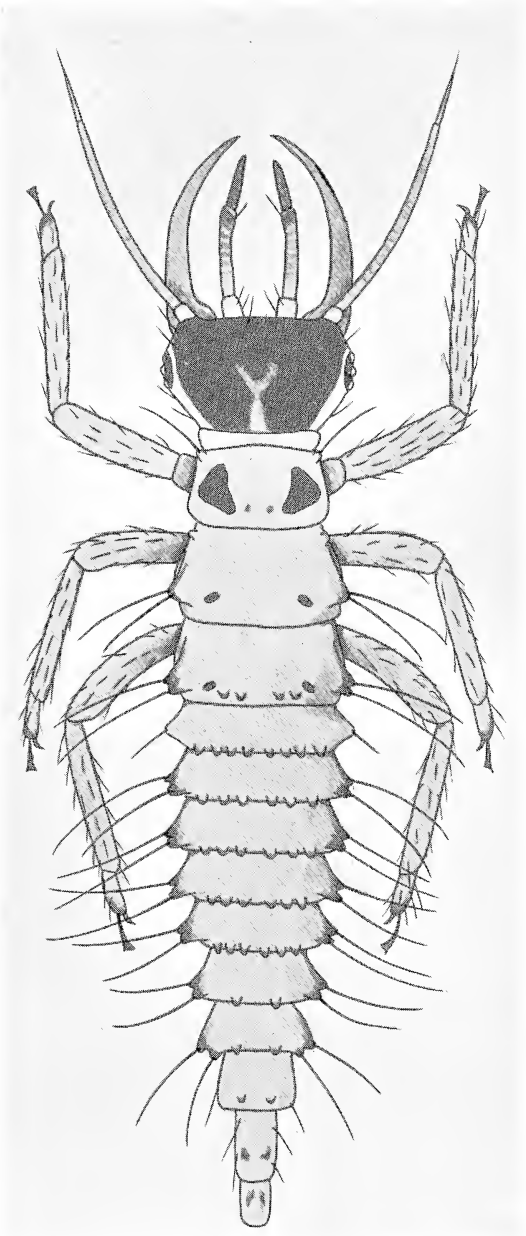
D. E. Kimmins

(*British Museum, N.H., Dept. of Entomology*).

The first instar larva of Nathanica capitata (Fabr.) (Neur.).

The following description has been made from larvae bred from eggs laid in captivity by a female taken at Chipperfield, Herts, 14.vii.38, by Mr. R. B. Benson. The larvae were offered various aphides but did not feed readily, and did not reach maturity.

Head transverse; anterior margin almost straight, sides diverging slightly to the eyes and converging strongly to posterior margin. Dorsal surface fuscous; a conspicuous white streak on sides of head, extending above eyes, and a pale epicranial suture as in *N. fulviceps* (Steph.). Antennae three-segmented, longer than jaws, basal segment short, a little longer than wide, colourless. Second segment very long, with pale fuscous annulations, third short, tapered, about twice as long



Nathanica capitata Fabr., 1st instar larva (dorsal setae omitted).

as the basal. Palpi shorter than the jaws, pale fuscous, darker apically, second segment the longest, annulated. Jaws yellowish-brown, about twice as long as head.

Body above pale buff, soon with a brownish tinge showing from within. Prothorax with a setigerous tubercle on each anterior angle. Meso- and metathorax with slight, dorso-lateral, greyish prominences towards the posterior margins, each bearing two strong curved yellowish setae. Thoracic sclerites as in *fulviceps*.

First abdominal segment with a small prominence on each side bearing a small seta. Segments 2-7 with strong bifid prominences, each bearing two long, curved, yellow-brown setae. Other setae in transverse rows on dorsum of thorax and abdomen as in *fulviceps* (omitted in Plate IX to avoid confusion).

Legs pale, apices of tarsi and the empodia fuscous or blackish.

On comparing the first instar larva of *N. capitata* with the very full description given by Killington (1935) of *N. fulviceps*, the following differences may be noted: Head fuscous, not yellowish; basal segment of the antennae pale; body paler; prothoracic prominence with one seta, not two; prominences of first abdominal segment with short setae; legs with no fuscous shading on femora or tibiae. The form is apparently more elongate, although the larva of *fulviceps* may have contracted through the action of spirit. In my figure of *capitata* (Plate IX), the setae of the dorsal abdominal prominences have been omitted to avoid confusion of the outlines.

Descriptions of the egg and third instar larva of *N. capitata* have been given by Withycombe (1923) and Killington (1937).

References.

Killington, F. J. 1935. Notes on the habitat and life-history of *Nathanica* (*Nothohrysa*) *fulviceps* (Steph.) (Neuropt.). *J. Soc. Brit. Ent.*, **1** (4): 110-113.

———— 1937. A Monograph of the British Neuroptera, **2**: 235-246. Ray Society, London.

Withycombe, C. L. 1923. Notes on the biology of some British Neuroptera (Planipennia). *Trans. Ent. Soc. Lond.*, **1922**: 501-594.

D. E. Kimmins

(*British Museum, N.H., Dept. of Entomology*).

Parasites of Cucullia verbasci Linn. (Lep.).

In 1935 I bred two males and two females of *Compsilura concinnata* Mg. and one male of *Phryxe nemea* Mg. (Dipt., Tachinidae) from five larvae of *C. verbasci* taken near East Malling, Kent. Unfortunately, my notes do not give the dates

of emergence, but it was some time between the middle of August and the middle of September.

I am indebted to Dr. O. W. Richards for the identification of the parasites.

G. A. Brett.

Notes on the Woodwasp, Xiphydria dromedarius F., on the Cricket-bat Willow.

The woodwasp, *Xiphydria dromedarius* F., is said to occur rarely in Britain, but appears to be more common than is generally supposed. The larvae are recorded as living in the wood of willow, poplar and elm. Few detailed accounts of its biology appear to have been published, the most noteworthy being those of Leisewitz (1897) and Chrystal and Skinner (1932). The former studied the species on elm, while the latter authors studied it on willow. Chrystal and Skinner in addition record some interesting observations on the biology of an Ichneumonid parasite, *Thalessa curvipes* Grav. The record of the species on the cricket-bat willow, *Salix alba* var. *caerulea* Smith, is thought to be a new and more exact host record than previously given.

The author recently made a survey of the entomological fauna of the cricket-bat willow, with a view to finding which insects were most likely to be responsible for the transmission of the watermark disease of this tree. In the course of this work specimens of *X. dromedarius* were encountered on or near bat willows on numerous occasions. The insect appears to be more commonly found on bright sunny days. The rapid flight of the species, however, prevented the capture of all but the following :—

1 ♀ ovipositing in trunk of young tree, Chelmsford, Essex, 19th June, 1936.
1 ♀ resting on branch and 2 ♀♀ flying, Braintree, Essex, 6th July, 1936.
1 ♀ resting on trunk and 1 ♀ flying, Halstead, Essex, 10th August, 1936.

A small stand of dead bat willows was found at Halstead, Essex, on 15th August, 1936, with some dozens of dead woodwasps partially protruding from holes in the trunks. The trees had almost certainly been killed by the honey fungus, *Armillaria mellea* (Vahl) Fr., or drought, or a combination of both. Mr. W. H. Goddard was responsible for drawing my attention to this phenomenon. Trees attacked by the honey fungus are usually understood to be killed by the sudden cutting off of the water supply, and the wood of the bat willow is known to dry out extremely quickly. The most feasible explanation, therefore, seemed to be that the woodwasps on emergence as adults

had been prevented from making their escape from the larval tunnels in which pupation takes place by the rapid drying of the wood following the death of the tree.

At Barton Mills, Suffolk, observations were made on two young cricket-bat willows. These were planted five feet apart, appeared very similar, being eighteen inches in girth at breast height, and were probably about four years old. Although apparently growing under similar conditions one tree was alive and the other dead. The dead tree had been killed by *Armillaria mellea,* and the dense, white, felt-like mycelium of the fungus was disclosed on removing the bark from the base of the tree. The death of the tree had taken place comparatively recently, probably during the last few weeks. Some of the foliage had already dropped, but many of the remaining leaves, although showing the pale appearance typical of the disease, still had a green colour and were not brown and dry. The bark of the trunk, however, had started to dry and showed numerous longitudinal cracks.

On 18th August, and again on 20th August, 1937, woodwasps were seen ovipositing in the dead tree. Six females were observed in all and later collected, four specimens on the former date and two on the latter. On these days the trunks of both the dead and living trees were equally exposed to bright sunlight, but woodwasps were only seen on the dead tree. During oviposition the actions of the insects were observed and agreed closely with the description of Chrystal and Skinner. When the bark was removed egg clusters were found lying freely exposed.

It is now well known that there is a very definite succession of insects attacking timber. This has been correlated with the moisture and starch content of the timber at various periods after felling. Thus newly-felled timber, while still green and with a high water content, is first invaded by the Scolytidae (bark beetles) and Platypodidae (ambrosia beetles). When the moisture content of the timber falls during seasoning, it is no longer attractive for the oviposition of these beetles, and the timber is now attacked by the Lyctidae (powder-post beetles) and Bostrychidae. Later when seasoning is complete the timber is invaded by the Anobiidae (furniture beetles).

Chrystal and Skinner in their experiments with *X. dromedarius* used willow logs which were quite green, and in these the females readily oviposited. They state that there is reason to believe that under natural conditions fairly fresh stems are chosen by the ovipositing females.

The observations recorded above show that the woodwasp probably plays a similar part to that of the bark beetles and ambrosia beetles, in being the first in the succession of insects attacking the timber of the bat willow. There appears to be

little doubt that the woodwasp does not attack living bat willows, but only invades trees when recently dead and still quite green.

Summary.

The woodwasp, *Xiphydria dromedarius* F., which appears to be more common than is generally supposed, was found on a number of occasions on or near the cricket-bat willow, *Salix alba* var. *caerulea* Smith.

Woodwasps were observed ovipositing in the trunk of a young bat willow recently killed by the honey fungus, *Armillaria mellea* (Vahl) Fr., under circumstances such as to suggest that trees which are still green but in which the wood is drying are attractive for oviposition, while living trees are unsuitable.

The above observations were made while the author was undertaking a survey of the watermark disease of the cricket-bat willow under H.M. Forestry Commission and the Agricultural Research Council.

REFERENCES.

LEISEWITZ, W. 1897. Ein Beitrag zur Biologie der Holzwespen, *Xiphydria dromedarius* Fabr. an Ulme. *Forst. Naturwiss. Zeit.*, **6**: 207-224.

CHRYSTAL, R. N., and SKINNER, E. R. 1932. Studies in the biology of the woodwasp, *Xiphydria prolongata* Geoffr. (*dromedarius* F.) and its parasite *Thalessa curvipes* Grav. *Scot. For. J.*, **46**: 36-51.

E. McC. CALLAN

(*Imperial College of Tropical Agriculture, Trinidad, B.W.I.*).

Assembling of Thersilochus rufiventris Brisch. (Hym., Ichneumonidae).

On 15th June, 1936, males of *Thersilochus rufiventris* Brisch. were observed assembling in large numbers around a few females at Writtle, Essex. The females were ovipositing in the galls of *Pontania proxima* Lep. (*gallicola* Steph.) on the leaves of the cricket-bat willow, *Salix alba* var. *caerulea* Smith. The observation was made at 3 p.m., in brilliant sunshine on an extremely warm day. Some hundreds of assembling males were present and showed a peculiar dancing flight around the ovipositing females. About twenty females in all were noticed ovipositing, but mating was not observed.

On 17th June, 1936, the locality was revisited. There was bright sunshine, but the weather was not so warm as on the previous occasion. Neither assembling males nor ovipositing females were observed. A number of galls were collected. These produced specimens of *P. proxima* on 21st and 23rd June, 1936, but no specimens of *T. rufiventris*.

Visits were again made to the locality on 16th July and 15th August, 1936. Neither assembling males nor ovipositing females were observed. A number of galls were collected, from which specimens of *P. proxima* emerged on 15th, 21st and 22nd August, 1936, but no specimens of *T. rufiventris* were obtained. A single female of *Angitia vestigialis* Ratz., however, emerged on 28th August, 1936, from a gall collected on 15th August, 1936.

From the above observations it is probable that *T. rufiventris* is a parasite of *P. proxima,* although none was reared from this host. One male and one female of *T. rufiventris* have been retained in the collection at the British Museum (Natural History), and others are in my own collection. Specimens of *T. rufiventris* and *A. vestigialis* were kindly determined by Mr. J. F. Perkins.

E. McC. Callan.

(Entomology Dept., Imperial College of Tropical Agriculture, Trinidad, B.W.I.).

Unusual form of Plusia iota L. (Lep.).

I have taken in Wiltshire a very light form of this moth in which the usual rhomboid chocolate dorsal blotch is a golden-yellow. The reniform stigma is clearly defined. The paler shade of the wings and fringe is cream coloured with a slight rosy tinge on the costa.

I have examined a large number of specimens in various collections, but have not seen before such a distinct pale variety.

Walter L. Freer.

Telphusa aethiops Westw. (Lep.) in Hampshire.

On May 7th, 1922, I took five specimens of this Gelechiid on a burnt patch of heather near Chandler's Ford, between Southampton and Winchester. In spite of many attempts to find the species since, I met with no success until this year, 1938, when the chance capture of a single specimen near Beaulieu Road Station directed attention to a charred and blackened patch of heathland, left by one of the numerous fires of this exceptionally fine, dry spring. Here the moth was fairly common at 5 p.m., flying off when disturbed and settling on the black ground a few steps further on.

Two points call for notice, the date and the locality. Stainton (1865, Nat. Hist. Tineina, **9** : 220) says that the moth appears from mid-May to the beginning of June, and this is probably true of northern localities in a normal year. The captures here recorded, however, were made on 8th April, the early date being possibly due to the fine, warm weather this year during March and early April. The distribution as given by Meyrick

(1928, Revised Handbook of Brit. Lep.: 617) is Surrey, Berks, Cheshire to the Clyde, so that a third southern county must now be added to the list of localities for this supposedly northern species.

WM. FASSNIDGE.

Notes on collecting cases of Whittleia reticella Newn. (Lep.).

At the end of May, 1937, males of this Psychid were taken at Cracknore Hard, on Southampton Water, opposite the New Docks. As it is necessary to collect cases in order to obtain females, attempts were made to find them on April 5th and 6th, 1938, in delightful spring weather. On the first day fourteen were found by two searchers in about two hours by painfully bending down and scraping with the fingers at the short growth of salt-marsh herbage. The larvae drop at the slightest provocation, and their cases are then to be found lying on the wet mud. On the second day a novel method was tried, which met with better success. A strong garden rake was used to gather up with short, swift strokes the dried grass and other débris; this accumulation was put on a beating-tray and examined, with the result that an average of about one case for every two rakings was taken, and fifty or sixty in about two hours.

In order to get some information about the food-plant in this locality, a search was then undertaken on hands and knees—of course, with a waterproof kneeling pad. Larvae were found sparingly, sometimes two or three close together, and all were on the blades of a species of fescue grass, which grows freely among the many plants peculiar to such a locality. Nowhere on the marsh does *Glyceria maritima* Wahlb. flourish, and a long search for it last year only yielded a few patches of stunted plants. In fact this salt marsh seems to be rather different from those at the mouth of the Thames, for there is no *Artemisia maritima* L., but plenty of *Atriplex, Triglochin, Limonium, Armeria, Tripolium* and *Juncus gerardi* Loisel. It should be noted that the spring tides a week or two earlier had flooded the salterns, where the larvae were found, to a depth of over two feet.

WM. FASSNIDGE.

Some records of British Lonchoptera (Diptera).

In a recent paper (1938, *Ent. mon. Mag.*, **74**: 60-65, 7 figs.), Mr. J. E. Collin has dealt with the British species of *Lonchoptera,* recording several new ones. The following notes extend the range of some of the rarer species :—

L. scutellata Strobl.

A female of this species was captured at Berks, Virginia Water, 8th March, '33. It was found in a tussock of *Carex paniculata* growing at the head of the large lake.

L. nigrociliata Duda.

♂, Brecon, Llanthony Abbey, 3rd April, '34; ♂♀, Surrey, Leatherhead, in bed of R. Mole, 23rd June, '28. These specimens have kindly been examined by Mr. J. E. Collin. Both lots were obtained on shingle by flowing water.

L. furcata Fallen.

The true male of this species was not recognised until Mr. Collin described it, and it is much more rarely taken than the female. I captured one (det. J. E. Collin) in Mid-West Yorks, Ingleton, 1st July, '36. This was at grass-roots on the dry limestone hillside.

O. W. Richards.

A Chalcidid Hyper-Parasite on a Braconid (Hym.).

When staying with friends at Woking in 1924 on 15th June I was on the look-out for Hymenopterous parasites. On the underside of a Common Heracleum (Cow Parsnip) leaf I found a *Praon* (Braconidae) had parasitised an aphide and constructed the well-known 'tent-like' shelter for pupation, surmounted by the empty body of the aphide.

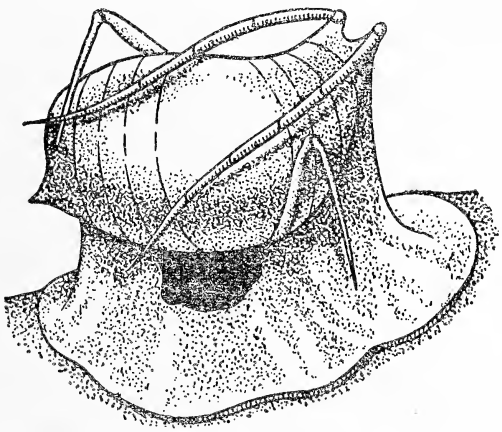


Fig. 18.—Puparium of *Praon* surmounted by the body of its host.

Walking about and inspecting this pupated *Praon* was a Chalcidid, which I captured, and, placing both under my dissecting microscope, watched the Chalcidid for some time. It continued to walk round the *Praon* and inserted its ovipositor in three places. On the fourth occasion it seemed to find the right spot. Having done so, it withdrew its ovipositor, enlarged the opening with its mandibles, and then inserted its ovipositor for about one minute, agitating its antennae but keeping its wings quiet.

After the Chalcidid had withdrawn its ovipositor and was still wandering about in captivity under an inverted watch glass, I introduced an ordinary parasitised aphide, stuck down on a leaf, but with no 'tent-like' shelter underneath; the Chalcidid took no notice of it, though I watched it for six minutes.

Then I introduced another aphide with a tent-like shelter underneath: the Chalcidid went to it immediately, feeling it all over with the sensory organs at the tip of its abdomen. It inserted its ovipositor in two places and was so busy that I removed the watch glass covering the specimens for some time.

On 10th July I dissected one of the cocoons of the *Praon* and found a pupa inside; this, of course, did not become an imago, but on 12th July a Chalcidid emerged from the first *Praon*, twenty-seven days after the egg was laid by the Chalcidid. This Chalcidid I killed and mounted. The aperture from which the Chalcidid emerged is shown in the illustration.

Mr. G. E. J. Nixon, B.A. (Dept. of Entomology, Brit. Mus., Nat. Hist.) has very kindly helped me in the preparation of this note and has shown the Chalcidid to Dr. Ferrière, who thinks it is probably *Pachyneuron aphidis* Bouché.

R. Beck.

A joint Infestation of Barley by Lasiosina cinctipes Mg., together with Chlorops taeniopus Mg. (Diptera, Chloropidae) and their Hymenopterous Parasites.

On 31st July, 1937, I collected 165 stunted barley shoots (in several roughly randomised groups) from a 0·83 acre plot, containing three different spring sown varieties of this cereal. The economic importance of the epidemic was shown by the fact that it was found by a method of random sampling that twenty-five per cent. of the shoots in the field failed to produce normal ears. There was no significant difference in the susceptibility of the different varieties to attack. For this information I am indebted to my colleague, Mr. A. J. Marval, Crop Recorder to the Ministry of Agriculture.

Sixty-four of the shoots collected were dissected while fresh, and the remainder were placed in a large jar, over the mouth of which two layers of flannel were tied. Notes were made of the contents of each of the freshly dissected shoots, and the pupae obtained were divided into groups according to what appeared to be their species and placed in separate glass-topped boxes, where the adult insects emerged.

Two dipterous species were found to have attacked the plants in large numbers. These were determined by Dr. F. W. Edwards as *Chlorops taeniopus* Mg., the well-known gout fly, and the much less well-known *Lasiosina cinctipes* Mg., both being Chloropids.

Two species of hymenopterous parasites were also found; one, a Braconid, was determined by Mr. G. E. J. Nixon as *Coelinius niger* Nees., and the other, a Chalcidid, was found to be *Stenomalus micans* Ol. (Pteromalidae) by Dr. C. Ferrière.

I should like here to acknowledge my indebtedness and express my gratitude to these three specialists of the British Museum (Natural History) for kindly making the above determinations, and for giving me further information in connection with this work.

On 21st October the contents of the jar, 101 shoots, were examined, under my supervision, by some of my pupils at the Lord Wandsworth Agricultural College. The shoots were carefully dissected and the specimens obtained, identified and counted. The following table gives the numbers of individuals found in all the 165 shoots examined (*i.e.* those examined in July plus those examined in October):—

Chlorops puparia	57
Chlorops puparia from which an insect failed to emerge	1*
Chlorops adults	37
Lasiosina puparia	35
Lasiosina puparia from which an insect failed to emerge	4
Lasiosina adults	22†
Coelinius adults (produced from some of the above puparia) ...	19 (and 4 much smaller specimens).
Stenomalus adults	52

Four Cecid adults were also bred from the stunted shoots, and about the same number of Cecid larvae were found when the leaf sheaths were split open. The larvae were orange in colour. It is assumed that these forms do not affect the considerations of this article because of their small numbers and because they are believed to attack only the ears.

In the detailed dissection of the sixty-four freshly gathered shoots, four shoots which were found to contain a single puparium of *Lasiosina* only, were not typically gouted as when attacked by *Chlorops*. The shortened internodes were not swollen and the ear was much less developed. This must mean that the *Lasiosina* larvae attacked the central shoot when it

* This puparium had a puparium of *Lasiosina* adhering to its anterior end.

† It seems, on balancing up puparia with adults, that nine *Lasiosina* adults escaped notice. Six of the puparia, however, to judge from the bitten appearance of the open end, had produced a *Coelinius* adult or some similar form.

was at a much earlier stage of development than when attacked by *Chlorops*.*

Dr. Edwards has informed me of an interesting parallel to this case afforded by a pair of Chloropids which attacked reeds (*Arundo*), one species, *Liparia lucens,* making large swellings in the shoots, whilst the other, *L. similis,* made only slight swellings.

In each of three other shoots which were not typically gouted, and therefore had probably been attacked by *Lasiosina,* I found only a *Stenomalus* pupa. This, as one of the three pieces of evidence supporting the view that *Stenomalus* had parasitised *Lasiosina,* is a point of some interest, since Dr. Ferrière has informed me that he has no record of *Lasiosina* as a host of *Stenomalus micans*.

Eight typically gouted shoots contained a *Stenomalus* pupa only. This indicated that *Stenomalus* had parasitised the larva of *Chlorops*. The latter is well known to be a host of this parasite (see K. M. Smith, 1931, A Textbook of Agricultural Entomology, Cambridge: 238).

Three of the fresh, stunted shoots were found to contain no insect at all. One of these had clearly been attacked by the larva of *Chlorops*. The other two appeared to have been attacked by *Lasiosina*. One may here suppose that these two shoots, like those mentioned above, had possibly contained *Lasiosina* larvae which had been parasitised by *Stenomalus,* but that the latter had emerged and left the shoot. The thin membranous remains of the pupal integument, which is all that is left behind by this Chalcid, would be easily overlooked. That *Stenomalus* was in its period of emergence when the shoots were gathered was shown by the fact that two of the pupae removed from the shoots, and kept in the glass-topped boxes, produced adults during the next three days.

In this last observation lies the clue to a partial explanation of the fact that although 165 stunted shoots were used for breeding, the total number of *Chlorops* puparia, plus *Lasiosina* puparia, plus *Stenomalus* adults obtained ($57 + 35 + 52 = 144$)—*i.e.* all individuals which could have caused stunting, or their parasites—was considerably less than 165. Very few individuals, possibly five, of any other dipterous species were found in all 165 shoots, apart from the Cecids already mentioned. Moreover in eleven out of the sixty-four cases examined in detail, *Chlorops* and *Lasiosina* had attacked the same shoot. In nine of these cases there were two, and in two cases there were three individuals present in one shoot. Thus there must have been

* That *Lasiosina* larvae also sometimes attacked the shoot at a later stage was shown by the fact that in eleven cases, this species was found with *Chlorops* in a gouted shoot (as mentioned later).

more than twenty-one shoots (165 – 144) which, at the time of gathering, contained no specimens of any of the above species, and from some of which, therefore, a *Stenomalus* had probably already emerged. The total number of *Stenomalus* that had been present in the 165 shoots may thus possibly have been much greater than the fifty-two bred out.

Forty-two of these *Stenomalus* adults were carefully examined and showed a wide and continuous range of variation in size, the ten largest being about thirty-three per cent. longer than the ten smallest. This fact also supports the view that the species had developed in the larvae of both Chloropid species, since the average length of the *Chlorops* adults was about thirty-three per cent. greater than that for the adults of *Lasiosina*.

The question of whether *Coelinius* parasitised *Lasiosina* still remains. It is already well known to parasitise *Chlorops*.

The life-history of *Coelinius niger* differs from that of *Stenomalus micans* in that the latter pupates before the host larva can do so, whereas the former allows the host to form a puparium, inside which it pupates. Three of the *Chlorops* puparia removed from the green shoots which were examined in detail produced *Coelinius,* and it was found that the empty puparia could be distinguished from those which had produced an adult *Chlorops* by the fact that the former had the anterior end irregularly bitten off, whereas the latter usually had the end simply split open, and, as a rule, not broken off.

On comparing the puparia of *Chlorops* with those of *Lasiosina,* it became clear that the difference in size of this stage in the development of the two species was strikingly greater than the difference in size of the adults. The puparia of *Chlorops* were from 50-100 per cent. longer than those of *Lasiosina,* whilst the length of the adults of *Chlorops* was, on the average, only about 33 per cent. greater than that of *Lasiosina,* as already stated. Nineteen of the total of twenty-three *Coelinius* adults bred out were large insects which appeared to fit rather tightly into the puparia of *Chlorops*. One would, therefore, expect this parasite to develop with difficulty in the much smaller puparia of *Lasiosina*. Actually, no *Coelinius* adults were bred from the *Lasiosina* puparia in the glass-topped boxes, but four specimens of the former were found among the contents of the bell-jar which were so much smaller than the other nineteen that they appeared to belong to a different species. After examining them, however, Mr. Nixon said that he believed them also to be specimens of *Coelinius niger*. Six *Lasiosina* puparia were found with the ends appearing irregularly bitten, or perhaps, in some cases, broken off. It is, therefore, probable that some of these produced the smaller *Coelinius* specimens.

The foregoing facts together indicate that most of the larvae successfully parasitised by *Coelinius* were the larvae of *Chlorops,* and that *Coelinius* did not successfully parasitise more than a very small proportion of the *Lasiosina* larvae.

In the case of a larva parasitised by both *Stenomalus* and *Coelinius,* the former would presumably have the advantage, since it matures earlier. This may partly account for the great preponderance in the numbers of *Stenomalus* adults over those of *Coelinius.*

To sum up, the above facts and considerations taken together show:

(*a*) That the barley was heavily infested by both species of Chloropid, *Lasiosina* being about two-thirds as numerous as *Chlorops*; to judge from the results of the detailed examination of the sixty-four fresh shoots, rather less than half (about nine in twenty) of the *Lasiosina* larvae present appear to have attacked the barley earlier than *Chlorops,* destroying the ear at a very early stage. The remainder seem to have attacked the plants simultaneously with *Chlorops,* individuals of the two species developing together in the same shoot.

(*b*) That a large proportion, certainly over one-third and probably about a half, of the total number of Chloropid larvae were successfully parasitised by the Chalcidid, *Stenomalus*; whether or not *Stenomalus* parasitised *Lasiosina* cannot be stated with certainty, but there are grounds for believing that it did, although the evidence is purely circumstantial.

(*c*) That a relatively much smaller proportion, considerably less than 16 per cent. (*i.e.* $\frac{23}{143} \times 100$) of the total number of Chloropid larvae were parasitised successfully by *Coelinius niger* Nees., and that the larvae which the latter parasitised successfully were, at least mainly, those of *Chlorops.*

F. D. Goodliffe.

A peculiar union of the legs in a nymph of Corixa punctata Illig. (Hemiptera, Corixidae).

During the spring of 1938, work was in progress on the rearing of *Corixa punctata* Illig. (=*geoffroyi* Leach) from the egg. Eggs were kept in water in glass tubes which were placed in a thermostat at 18°C. Each day, newly-emerged insects were removed from the tubes with a pipette, and then placed in new receptacles where they were provided with food.

On one occasion, whilst newly-hatched nymphs were being sorted, one specimen could not be freed from its empty egg shell. An examination under a binocular microscope showed that it was attached to the egg shell by the claws of its right hind leg, which were unnaturally curved and deformed. On

turning the insect over in order to free it, it was found that the deformity was not confined to these claws. The left hind leg and the left middle leg were curiously fused together for the greater part of their length. The two legs possessed a common coxa and femur, both joints being of great size. No trochanter could be distinguished. From the femur arose the remaining parts of the double leg. The intermediate leg could easily be distinguished from the hind leg by its shorter length and by its anterior position. It was apparently identical with a normal intermediate leg. The hind branch of this monster limb, however, was made conspicuous by having a bend in its tarsus, the

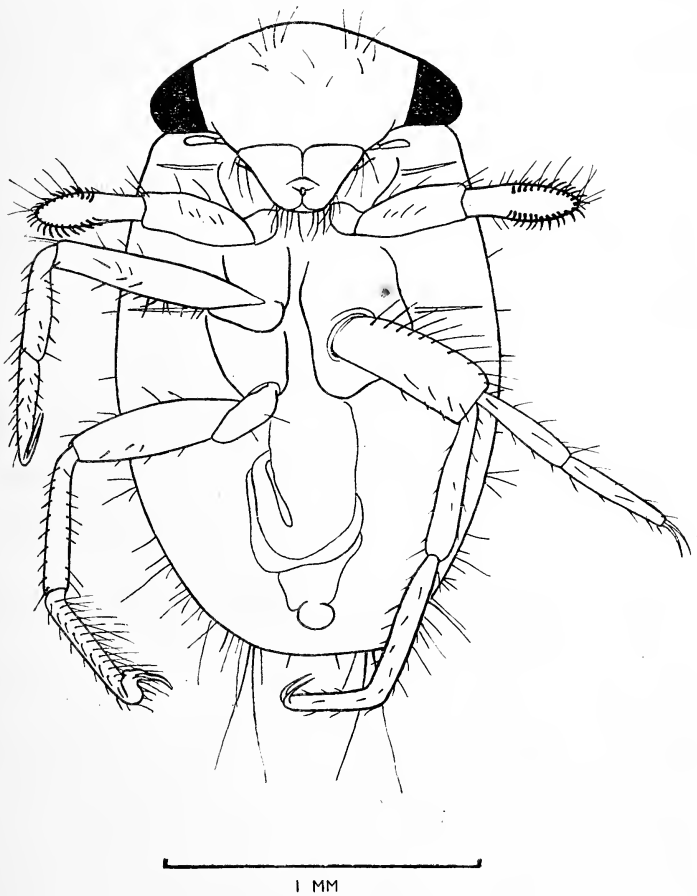


FIG. 19.—*Corixa punctata* Illig. Ventral view of a first instar nymph, the left intermediate and hind legs of which are united at their bases.

claws of which were recurved to form a hook; this leg did not possess the usual swimming hairs characteristic of the hind legs of these water bugs. The appearance of the insect is shown in fig. 19.

The Corixid was kept alive in a dish of water and was provided with silt, algae, and small aquatic animals as food. It was unable to swim, but managed to push its way around the dish with jerky movements of the limbs of the right side. It fed a little on the material provided, but within two or three days it became exhausted, and on the sixth day after hatching it was found dead.

Of the large number of nymphs of this species reared during the spring, the specimen here described was the only one found in this condition, although occasionally a nymph was discovered with deformed claws.

C. J. Banks
(*Dept. of Zoology, University College, Southampton*).

Satyrus galathea (L.) (Lep.) attacked by birds.

A male blackbird was seen to capture a *Satyrus galathea* in my garden at Friston, near Eastbourne, in July, 1938. It hurried away into the rose bushes, apparently to devour its captive. Many specimens of the butterfly were found to be damaged by birds.

C. M. Jannings.

Lysandra coridon (Poda) (Lep.) feeding on horse droppings.

Walking down a warm grassy lane on the South Downs this summer, I saw five specimens of *L. coridon* at rest on horse-droppings. So intent were they on their feeding that I was able to secure three of them at once.

C. M. Jannings.

Resting place of Pararge megera (L.) (Lep.).

Following a specimen of this butterfly one evening this summer on the South Downs, I saw it disappear into a partly cut haystack. Quickly placing my net over the spot, I was astonished to see about half a dozen other specimens fly out from gaps in the haystack into which they had, apparently, retreated for the night.

C. M. Jannings.

Second, Third and Fourth Congresses of the Society for British Entomology.

Second Annual Congress, Cambridge, 1936.

The Second Annual Congress of the Society was held in the Department of Zoology, University of Cambridge, from the 26th-29th June, 1936, in co-operation with the Cambridge Natural History Society. About sixty members and visitors attended the Congress.

The Presidential Address of Dr. A. D. Imms, D.Sc., F.R.S., was delivered in the lecture theatre of the Department of Zoology on the morning of the 27th. The subject chosen was 'Insect Phylogeny.' The address was later published in the Transactions of the Society (1936, **3**: 1-32). The remainder of the morning session was taken up with a general discussion on Wicken Fen. Before assembling for lunch in Christ's College, members and visitors gathered outside the Department of Zoology for the official photograph of the Congress.

In the afternoon, visitors assembled in the lecture theatre to hear Dr. C. B. Williams' address on 'Insect Migration.' He was followed by Dr. W. H. Thorpe, who spoke on the respiration of larvae of parasitic Hymenoptera and Diptera.

In the evening the Congress Dinner was held in the hall of Christ's College, and was preceded by a reception by the President and by a conversazione.

The following day, 28th June, was devoted to an all-day excursion to Wicken Fen. This was well attended, and the fine weather greatly added to the success of the day.

On Monday, the 29th, members reassembled in the lecture theatre. Mr. G. C. Varley spoke on the fauna of the knapweed, and Mr. G. J. Kerrich read a paper by Dr. C. G. de Worms on the Lepidoptera of the Fenland. An address by Dr. G. Salt on the problem of host selection by certain parasitic Hymenoptera concluded the morning's meeting.

The afternoon meeting was opened by Dr. Kenneth M. Smith's address on the subject of insects and virus diseases. The valedictory address of the President followed, when it was announced that the Society would hold its next Congress in Reading at the kind invitation of the Reading and District Natural History Society.

Third Annual Congress, Reading, 1937.

In co-operation with the Reading and District Natural History Society, the Society for British Entomology held its Third Annual Congress in the city of Reading from 9th-12th July.

Meetings were held in a lecture theatre which the University authorities kindly put at the disposal of the Congress. Pro-

fessor W. B. Brierley, D.Sc., F.L.S., opened the proceedings with an address of welcome. He was followed by the President of the Society, Dr. B. M. Hobby, M.A., D.Phil., F.R.E.S., who chose as the subject for his address 'Predacious Insects and their Prey.' Mr. J. A. Downes then addressed the meeting and spoke on the fauna of the dock. The official photograph of the Congress concluded the first morning's programme.

After lunching in Wantage Hall, members reassembled in the lecture theatre to hear Mr. R. B. Benson discuss the present state of our knowledge of British sawflies. He was followed by Mr. C. Runge, Vice-President of the Reading and District Natural History Society, who gave an interesting account of the Lepidoptera of the Reading district. The remainder of the afternoon and the early evening was devoted to the examination of exhibits. Mr. W. E. Stoneman, of the Department of Zoology of the University, kindly consented to conduct visitors over the Zoological Museum.

A reception in the evening by the Vice-Chancellor of the University and the President of the Society for British Entomology was held in Wantage Hall. The reception was followed by a conversazione and by dinner.

Sunday, 11th July, was given over to an all-day excursion to Silchester Common. About thirty members were present and much interesting collecting was done.

The third and last day of the Congress was again held in the University lecture theatre. Three addresses were given during the morning. Mr. W. E. H. Hodson spoke first on *Narcissus* pests. Dr. Malcolm Burr then discussed the distribution of the British Orthoptera. Professor F. Balfour-Browne's address on the sculpture of the wing-cases of some water-beetles concluded the morning's meeting.

Only one address was given in the afternoon. This was by Mrs. K. J. Grant, who spoke on the migrations of *Plusia gamma* L. in Great Britain. This was followed by a discussion on insect migration in general. The President closed the meeting with his valedictory address, and expressed the hope that the Society would hold its next Annual Congress in Bournemouth.

Fourth Annual Congress, Bournemouth, 1938.

The Fourth Annual Congress of the Society for British Entomology was held in Bournemouth from 3rd-7th June. By kind invitation of the Bournemouth Natural Science Society, the Congress held its meetings at the headquarters of that Society. In this building an excellent lecture hall was available and ample accommodation was provided for the display of exhibits.

On the first day of the Congress, about twenty members met at Hengistbury Head for a field meeting. The opening meeting of the second day was held in the lecture hall of the Bournemouth Natural Science Society. Dr. O. W. Richards, M.A., D.Sc., F.R.E.S., President of the Society for British Entomology for 1938, opened the meeting with an address entitled ' The study of the distribution of British insects.' Capt. C. Diver then gave an interesting survey of the history and ecology of Studland Heath, Dorset. Before dispersing for lunch, members assembled outside in the garden for a photograph of the Congress to be taken.

In the afternoon, Dr. R. N. Chrystal discussed recent research on the insect enemies of bark-beetles and other forest pests, and he was followed by Professor G. D. Hale Carpenter, who addressed the meeting on the subject, ' Birds as enemies of butterflies.'

In the evening, a reception by the President was held in the Elstead Hotel, Bournemouth, and was followed by a dinner.

The whole of the next day was devoted to an excursion to the New Forest, when Dr. R. N. Chrystal conducted a party to visit certain areas of interest to the forester.

Another field meeting was held on the following day. Capt. C. Diver conducted a large party over Studland Heath, and illustrated his address of Saturday with a practical demonstration.

The last day's meeting was devoted to addresses. Dr. F. W. Edwards spoke first of the necessity and possibility of the formation of a purely entomological museum, and afterwards led a discussion of this topic. Capt. T. Dannreuther discussed the recent migrations of *Pieris brassicae* (L.). He was followed by Major H. C. Gunton, who gave an account of phenological and ecological records.

The first of the three addresses in the afternoon was given by Mr. H. P. Moon, whose subject was the ecology of aquatic insects. Lt.-Col. F. C. Fraser then gave an interesting account of the comparative morphology of the anal nervure in the Odonata. The final address was delivered by the President of the Society.

C. J. Banks.

A note on Micromus variegatus (Fabr.) (Neur.)

Sweeping long grass bordering the fence in my garden at Bournemouth, I was surprised to find four specimens of *Micromus variegatus* (Fabr.) in the net. A second sweep yielded three more, but that exhausted the supply for the time. The time was 10 p.m., 20th July, 1938. The following morning I tried again, sweeping over the long grass covering the vacant

plot adjacent to my garden. Only a single specimen was secured. At 10 p.m. the same night I again swept this plot and in about ten minutes secured nine specimens. From then onwards until 24th August numerous specimens were taken, but from that date they abruptly disappeared. This followed two very muggy, wet nights. As females at that time appeared to be non-fertile, I can only assume that a mass migration took place on that date. I have never managed to take this species in the Bournemouth area before, and its sudden appearance — on my doorstep, so to speak — looks as if the insect had been breeding in my garden during the previous spring or autumn. Last year my garden was a mass of nasturtiums which about August were invaded by black aphides to such an extent that nearly all the plants died. These were pulled up and thrown into a corner of the garden, but a good many found their way over the fence into the vacant plot next door. I suggest that the larvae were on these plants, for the greatest incidence of specimens was in the neighbourhood of the two dumps. Probability is given to this in that similar grassy plots within a stone's throw of the two mentioned failed to give a single specimen, even after repeated sweeping.

Sweeping by day only secured two specimens, and it was only when dusk descended that the insects began to appear. It is evident that they hide deep down in the grass during daylight and ascend to mate and feed after dark.

Sweeping after dark, in long grass, secured a vast mass of insect life, consisting for the most part of Diptera, Hymenoptera and, more especially, Hemiptera. F. C. Fraser.

Colias croceus (Fourcroy) (Lep.) ovipositing in close confinement.

I secured a female of *C. croceus* at Osmington Mills, Dorset, on 6th August, 1938, and after arriving home in Bournemouth, placed it on the lawn over birdsfoot trefoil beneath a small jam-jar. It remained here for two days, when it was found to be dead after a rather wet and cold night. Searching the trefoil under the jar, I found no less than thirty-four eggs had been laid. These were hatched, and the larvae, fed on a diet of Dutch clover, produced very large specimens.

A point of interest lies in the yellow suffusion of the black border seen in the males, but absent in the females. Captured specimens do not appear to have this suffusion, so possibly these yellow scales are shed during the first flight of the insect as in species of *Hylas*. F. C. Fraser.

Myrmica scabrinodis Nyl. var. sabuleti Meinert (Hym., Formicidae) in the New Forest.

I should like to add *Myrmica scabrinodis* Nyl. var. *sabuleti* Meinert to the list of ants captured by Mr. Brangham in the New Forest (1937, *J. Soc. Brit. Ent.*, **1** (7): 175-176). Mr. Brangham, though noting the fact that this ant had been taken in the Forest (see Donisthorpe, H. St. J. K., 1913, *Ent. Rec.*, **25**: 62; 1919, *ibid.*, **31**: 2), stated that he failed to find it there. I took it on April 19th, 1938, on the Beaulieu—Lyndhurst road between Matley Bog and Lyndhurst. B. D. W. Morley.

A few new records of British Formicidae (Hym.).

The following records of new localities for certain Formicidae are of interest:—

Leptothorax acervorum F. Church Stretton, Shrops.
Formica fusca L. var. *glebaria* Nyl. Bournemouth, Hants. (This ant has not, I believe, been taken in Bournemouth before, though it has been taken in the Forest.)
Formica rufa L. var. *rufo-pratensis* Forel. Long Sutton, nr. Basingstoke, Hants.
Lasius mixtus Nyl. Reading, Berks; Bournemouth, Hants.
Tapinoma erraticum Latr. Silchester, Berks. (Very abundant.)

B. D. W. Morley.

Myrmica scabrinodis Nyl. (Hym., Formicidae) at 1,200 feet.

In August, 1937, I took a specimen of this ant from a nest situated on one side of the Cwm Valley in the Longymynds, Church Stretton, Shropshire. The nest was placed at a height of about 1,200 ft. I believe that this is the highest British record of this ant. B. D. W. Morley.

Acridiidae (Orth.) in Worcestershire, E. Herefordshire and Shropshire, with a note on their ecology in the Malvern Hills.*

Dr. Malcolm Burr in his little book on 'British Grasshoppers and their Allies' (1936, p. xii) stated that for Worcestershire and Shropshire there are no records of Orthoptera. I have recently (5th-14th August, 1938), while collecting in these counties and in eastern Herefordshire, taken specimens of the following species in the neighbourhood of the places given below.

* Since this note was written a short list of Worcestershire Acridiidae has been published by E. Taylor (1938, Records of Worcestershire Orthoptera, *Ent. Mon. Mag.*, **74**: 210).

These all represent fresh additions to Dr. Burr's distribution maps.

	Worcestershire.	*E. Herefordshire.*	*Shropshire.*
Chorthippus parallelus Zett.	Ombersley Shrawley	Upper Egleton Storridge	Stapleton.
C. bicolor Charp.	Ombersley Shrawley Malvern		Stapleton. Church Stretton.
Myrmeleotettix maculatus Thunb.	Malvern	Storridge	Church Stretton.
Omocestus viridulus L.	Malvern		

The following ecological observations were made in the region of the Malvern Hills. On the low hills at Storridge, below 600 ft., *C. parallelus* was very plentiful in meadows but *M. maculatus* was absent. Between 600 ft. and 800 ft., *C. parallelus* disappeared and *M. maculatus* became prevalent. At these altitudes and right to the top of the Malvern Hills the rolled-leaved grasses of the Sheep's Fescue type predominate, but there are patches of the flat-leaved species. I collected for about five hours on the slopes of the Malvern North Hill and Beacon Hill above 800 ft. and found not a single specimen of *C. parallelus*. On the other hand, *M. maculatus* was present in very large numbers, the North Hill appearing to be about as thickly populated with this species as the lower meadows were with *C. parallelus*. Even at the top of the Beacon (1395 ft.) *M. maculatus* was not scarce. That this species had begun to reach maturity on these hills was shown by the fact that two pairs were observed *in cop.* on 13th August.

C. bicolor was generally distributed over the Malvern Hills, but was much less numerous than *M. maculatus* on the higher slopes. On the high land the immature, nymphal stages of *C. bicolor* were found mainly in the patches of the flat-leaved grasses.

Four specimens of *O. viridulus* were found at almost 900 ft. on flat-leaved grasses on the west side of the North Hill but not higher up. It therefore seems that this species is adapted to higher altitudes than *C. parallelus* but to lower altitudes than *C. bicolor* and *M. maculatus*.

It would have been interesting, but I unfortunately did not do it, to determine the precise species of the flat-leaved grasses occurring in the patches on the slopes of the Malvern Hills and then to see whether *C. parallelus* feeds on these same grasses in the meadows at lower altitudes. One would then be in a better position to say whether this species is absent from the higher land because of the absence of a suitable food-plant or for some other reason. Relative humidity is likely to play a part in the distribution of both grasses and grasshoppers.

F. D. Goodliffe.

Emergence of Tachinid larva (Dipt.) from its host.

On 20th July, 1938, Mr. E. W. Aubrook, while collecting in Bagley Wood, Berks, found a parasitised larva of a Noctuid moth (probably *Monima stabilis* View.), which he subsequently gave to me in order that I might attempt to rear the parasite. The larva was placed in a petri dish with some of the food-plant (sycamore), but it was very inactive and did not feed at all. Three days later I witnessed the emergence of the parasite larva from the host.

Firstly a large blister-like eruption was observed on the dorsal surface of the host, and soon the mouth-parts of the Tachinid larva could be seen through the integument, moving rapidly backwards and forwards with a scraping motion. Gradually the skin of the host was worn thin and finally ruptured, the parasite emerging immediately. The whole process of emergence occupied about ten minutes.

The parasitic larva was very active, and on being transferred to a tube of soil it at once burrowed down to pupate. The adult emerged on 5th August, 1938, and was submitted to Mr. C. J. Wainwright, who very kindly identified it as a female *Pales pavida* Meig., a well-known Tachinid parasite of many species of moths.

P. pavida belongs to Group 2 of Pantel (1910, *Cellule*, **26**: 31), the members of which deposit large numbers of very minute eggs containing fully formed larvae on the food-plant of the host. These eggs are ingested by the host larva and quickly hatch, the parasite making its way into the body-cavity of the host, where it completes its development.

Ernest Taylor
(*Hope Dept. of Entomology, Oxford University Museum*).

Sexual connection between males of Lasiocampa quercus Linn. (Lep.).

Having a female *L. quercus* Linn. emerge in my breeding cage during August, 1938, I took her to the downs near Cranborne, Dorset, in order to attract some males. The perforated zinc cage containing the female was placed upon the ground and left for about ten minutes while I was away collecting. On my return there were about a dozen males flying about and running over the cage, but I was astonished to find that two males, and there was no doubt that they were males, were quietly clinging to the side of the cage in sexual connection Two other males were attempting to do likewise. The first pair were dropped into a cyanide bottle, but even this did not make them separate. On reaching home I turned them out of the

killing-bottle in order to examine them more closely. The two males had become joined together by means of the harpes, both harpes being contracted and the two genitalia connected like links in a chain.

S. C. S. Brown.

The larval stage of Chimabache fagella Fabr. (Lep.).

Stainton (1854, Insecta Britannica. Lepidoptera: Tineina, p. 16) and Meyrick (1928, A Revised Handbook of British Lepidoptera, p. 673) give August to October for the duration of the larval stage. Being interested to know what is the stage during May, June and July, I kept a look-out for a female during March, 1938. On the night of 23rd March at Parley, Dorset, I found a pair 'in cop.' Ova were laid next day and for some days afterwards. Towards the end of April the ova turned orange, and the first larva emerged on 4th May. The larvae were fed chiefly on oak, and it was not until 18th October that the first pupa was noticed. Thus the larval stage lasts for at least six and a half months.

S. C. S. Brown.

Orthosia suspecta Hübn. (Lep.) in Dorset.

On 15th July, 1936, at Parley, East Dorset, I took two specimens of *O. suspecta* Hübn. at sugared oak leaves. There does not appear to be any previous record of its occurrence in this county.

S. C. S. Brown.

Odonata in North-East Hants, 1938.

Although it has been my habit for several years to capture and examine passing dragonflies, I did not decide to make a systematic search for these insects until the present year. It is impossible, therefore, to compare the relative abundance of all the species with previous years, but there is no doubt that this, in many respects, extraordinary season, has affected both the numbers and time of emergence of several species.

Our ponds, reservoirs and canal have rarely been so low, and the cold spells of April and May were not conducive to the early appearance of insects of this order.

The common *Aeshna cyanea* (Müll.), *Agrion virgo* (Linn.) and *Libellula depressa* (Linn.) were much less in evidence during 1938 than they usually are, and although I searched among the reeds at the Basingstoke canal every week, whatever the weather, it was not until 21st May that my efforts were rewarded. On this date a few very teneral *Enallagma cyathi-*

gerum (Charp.) and a number of more mature *Pyrrhosoma nymphula* (Sulz.) were about. Curiously enough, on the following day I captured a female *Agrion virgo* at Alice Holt Forest, a very early date under the circumstances.

Less than sixty years ago this district was one of the wildest parts of Southern England. It possesses several immense shallow ponds at Hawley, Fleet and Wolmer Forest, sluggish streams like the Blackwater and Cove Brook and numerous smaller ponds and reservoirs, in addition to the Basingstoke Canal, so that it is something of a dragonflies' paradise.

I captured and preserved at least one specimen each of twenty-four species during the present season. A list of these is given below with the date of first appearance immediately after the name.

ZYGOPTERA.

Agrion virgo (Linn.), 22nd May. Plentiful in Alice Holt.

Agrion splendens (Harris), 4th June. Plentiful at Cove Brook and fairly so in Alice Holt.

Lestes sponsa (Hans.), 11th July. Plentiful at Fleet Pond and the Basingstoke Canal.

Pyrrhosoma nymphula (Sulz.), 21st May. Plentiful everywhere near water.

Ischnura elegans (V. der Lind.), 4th June. Plentiful for miles along the Basingstoke Canal and at Fleet Pond.

Enallagma cyathigerum (Charp.), 21st May. Plentiful everywhere near water.

Coenagrion puella (Linn.), 28th May. Plentiful along the Basingstoke Canal and at Fleet Pond.

Erythromma najas (Hans.), 28th May. Plentiful at Aldershot (Basingstoke Canal).

ANISOPTERA.

Cordulegaster boltonii (Don.) (=*annulatus* (Latr.)), 25th June. A few at Fleet Pond and Aldershot.

Brachytron pratense (Müller), 28th May. A few at Aldershot and Farnborough Green.

Aeshna cyanea (Müller), 29th July. Usually common everywhere.

Aeshna juncea (Linn.), 24th August. Several at Fleet Pond

Aeshna grandis (Linn.), 23rd July. Plentiful at Fleet and Hawley ponds, Bourley reservoirs and the Basingstoke Canal.

Aeshna mixta (Latr.), 26th August. Common at Fleet Pond.

Anax imperator (Leach), 25th June. Plentiful for miles along the Basingstoke Canal and at Fleet and Hawley ponds.

Cordulia aenea (Linn.), 18th June. Fairly common at Aldershot (Basingstoke Canal).

Somatochlora metallica (V. der Lind.), 25th June. Plentiful for miles along the Basingstoke Canal.

Orthetrum coerulescens (Fabr.), 31st July. Plentiful at Fleet Pond, the Basingstoke Canal, Bourley reservoirs and the heaths between them.

Orthetrum cancellatum (Linn.), 2nd August. Fairly common at Fleet Pond and the Bourley reservoirs.

Libellula quadrimaculata (Linn.), 29th May. Plentiful near all bodies of still water.

Libellula depressa (Linn.), 26th June. Fairly common at Alice Holt and Kingsley.

Sympetrum s. striolatum (Charp.), 16th July. Plentiful everywhere near water and in woods. Last seen 12th November.

Sympetrum sanguineum (Müller), 23rd July. Plentiful at Aldershot (Basingstoke Canal), where I captured a male as late as 24th September.

Sympetrum danae (Sulz.), 3rd August. Plentiful at Fleet Pond and fairly so at the Bourley reservoirs, whilst one specimen was found at the Basingstoke Canal.

A. W. Richards.

Early appearance of butterflies, 1938.

The remarkably warm weather during March this year at Farnborough resulted in a number of early emergences in nature of non-hibernating butterflies. *Pieris rapae* (Linn.) was about on 23rd March, *P. napi* (Linn.) on 7th April, *Lycaena phlaeas* (Linn.) on 10th April, *Euchloë cardamines* (Linn.) on 13th April and *Pararge megera* (Linn.) on 27th April.

A. W. Richards.

Chalcidid (Hym.) parasites from Eriopeltis festucae Fourc. (Hemipt.).

On 25th June, 1938, the Coccid *E. festucae* Fourc. was found to be abundant on grass (*Festuca ovina* Linn.) on Farley Mount, Hants. A number was collected and kept alive in tubes in the hope of breeding parasites, and during July of the same year three different species of Chalcididae emerged from the Coccids. These have been submitted to Dr. Ch. Ferriére, who has kindly identified them as :

Cerapterocerus mirabilis Westw., 2 ♀♀, 1 ♂;
Metaphycus zebratus Mercet, 1 ♀;
Trichomasthus (?) *cyanifrons* Dalm., 2 ♀♀, 1 ♂.

Dr. Ferriére informs me that he believes the two latter species to be new to Britain.

The Coccid has previously been recorded for Hampshire, from Lyndhurst Road, in the New Forest (Killington, 1936, *J. Soc. Brit. Ent.*, **1** (5): 119).

FREDK. J. KILLINGTON.

A Hymenopterous parasite from Chrysopa albolineata Killington (Neur.).

A larva of *Chrysopa albolineata* Kill. was taken in my garden in Southampton on 20th June, 1938, and spun up for pupation a few days later. During my absence from home in August an ichneumon emerged, and has kindly been determined by Mr. G. J. Kerrich as *Hemiteles* (*Brachycephalus*) *aestivalis* Grav. The *Hemiteles* is a male, apparently of a rather dark form.

This is, I believe, the first recorded parasite of *C. albolineata*. On the other hand *H. aestivalis* has been found to parasitize several other species of *Chrysopa, viz. C. flava* (Scop.), *C. carnea* Steph., *C. ventralis* Curt., form *prasina* Burm., and *C. perla* (Linn.) (see Killington, 1936, A Monograph of the British Neuroptera, Vol. I, p. 178; Ray Society, London).

FREDK. J. KILLINGTON.

Trichoptera in the Chitty Collection.

Among the valuable collection of insects made by the late Mr. A. J. Chitty and presented, after his death, by Mrs. Chitty to the Hope Department in the Oxford Museum, was a single box of Trichoptera, mostly unset and in some cases damaged. As most of them had data it seemed worth while to work through the collection and to place the result on record. One or two species of some interest were found, though there is no record of any special importance. I am indebted to Mr. M. E. Mosely for help with some of the more awkward specimens.

Besides such vague localisations as 'S. Wales,' 'Yorks,' 'Lakes,' the records are distributed among the English and Scottish counties as follows: — KENT: Deal, Sheppey; HAMPSHIRE: Pamber Forest, New Forest; MIDDLESEX: Sunbury; OXFORD: Oxford; SUFFOLK: Huntingfield, Ipswich; WARWICK: Offchurch; ARGYLL: Loch Awe; PERTH: Rannoch; MORAY: Forres.

The following is the complete list:—

Phryganea striata L. One ♂, 'taken in the train on the way to Pamber Forest,' 1 June, 1902.

Grammotaulius nitidus Müll. One ♀, Deal, 17 July, 1892; one ♀ without data.

G. atomarius F. One ♂, Pamber Forest, 1 June, 1902.

Glyphotaelius pellucidus Retz. One ♂, New Forest, July, 1901.

Limnophilus marmoratus Curt. Three ♀♀, S. Wales, Sept., 1891; one ♂, Lakes, Whitsun (?), 1890.

L. stigma Curt. One ♀, without data.

L. lunatus Curt. Three ♂♂ and one ♀, Yorks, Aug.-Sept., 1889; one ♀, Deal, 1 June, 1891; two ♂♂ and three ♀♀, Forres, Sept., 1892.

L. centralis Curt. One, with body missing, no data.

L. vittatus F. One ♀ and one with body missing, no data.

L. affinis Curt. One ♀, Sheppey, 8 Sept., 1901.

L. auricula Curt. Two ♀♀, Yorks, Aug.-Sept., 1889.

L. griseus L. One ♀, Rannoch, Aug., 1900.

L. bipunctatus Curt. One ♀, Yorks, 1889.

L. luridus Curt. One ♂, Loch Awe, May, 1893.

L. sparsus Curt. One ♀, New Forest, 1892; one ♀ and one with body missing, no data.

Anabolia nervosa Leach. One ♂ without data; two ♀♀, Scots, Sept., 1895.

Asynarchus coenosus Curt. One ♂, Scots, Sept., 1895.

Stenophylax stellatus Curt. One ♂, Yorks, Sept., 1889; one ♀, New Forest, 1892.

S. vibex Curt. One ♀, Yorks, Aug.-Sept., 1889; one ♂, Huntingfield, 24 May, 1903.

S. permistus McLach. One ♀, Rannoch, 1900; two ♂♂, no data.

Micropterna lateralis Steph. One ♂ and one ♀, Yorks, 1889; one ♂, New Forest, June, 1892; three ♀♀, no data.

Ecclisopteryx guttulata Pict. One ♀, Yorks, Aug.-Sept., 1889.

Chaetopteryx villosa F. One ♂, New Forest, Oct., 1892.

Leptocerus spp. One ♀, Offchurch, Sept., 1890; one ♀, Sunbury, 20 May, 1896; one ♀, Pamber Forest, 5 June, 1904; one ♀, Autumn (?), Yorks.

Mystacides nigra L. One ♀, Oxford, 6 July, 1902.

Hydropsyche pellucidula Curt. One ♂, Pamber Forest, 5 June, 1904.

H. ornatula McLach. Two ♂♂ and four ♀♀, Sunbury, 20 May, 1896.

Tinodes waeneri L. One ♀, Yorks, 1889.

Metalype fragilis Pict. One ♂, no data.

Psychomyia pusilla F. Four ♀♀, Sunbury, 20 May, 1896.

Polycentropus flavomaculatus Pict. One ♀, Yorks, 1889.

P. stagnalis Alb. Two ♂♂, Ipswich district, 9 May, 1896.

Cyrnus trimaculatus Curt. One ♀, Sunbury, 20 May, 1896.
Silo pallipes F. One ♂ and one ♀, New Forest, July, 1891.
Glossosoma vernale Pict. One ♂, Forres, Sept., 1892.

L. W. Grensted.

Review: Animal life in fresh water. A guide to British fresh-water invertebrates. By Helen Mellanby, B.Sc., Ph.D. Crown 8vo, pp. viii + 296, 211 figs. Published by Methuen and Co., Ltd., London, 1938. Price 8s. 6d.

This book is designed to assist in the identification of fresh-water invertebrate animals and, while not going into too much detail, to supply a considerable amount of reliable information, which can be obtained only by considerable bibliographical research, about their structure, habits and life-histories. At the end of each section or chapter a list of reference books is given for those desiring further information. The text is not highly technical and the author throughout assumes on the part of the reader the minimum knowledge of animal structure and classification. The numerous text-figures are simple, clear and adequate, and in most cases original.

The work is of considerable value to entomologists, not only because a hundred pages are given to insects, but because the remainder of the text deals with a fauna which lives in close association with insects. Thus in other sections of the book many of the animals which parasitize or prey upon insects, or on which they themselves prey, are discussed and figured. The insect orders dealt with are the Collembola, Odonata, Plecoptera, Ephemeroptera, Hemiptera, Megaloptera, Neuroptera, Coleoptera, Lepidoptera, Hymenoptera, Trichoptera and Diptera. A separate section is devoted to every family and, in most cases, to every genus associated with fresh water.

The book concludes with an alphabetical index.

When a new edition becomes necessary it would be well if the author adopts the nomenclature given in the Generic Names of British Insects published by the Royal Entomological Society of London.

Fredk. J. Killington.

Review: Plebejus argus (L.). A new subspecies Plebejus argus caernensis. By J. Antony Thompson, M.A., F.Z.S., F.R.E.S. Pp. 6. Published privately, 1937. Price 9d.

This little pamphlet describes a subspecies of *P. argus* which occurs in certain localities on the rocky coast of north Caernarvonshire. Four varieties of the female of the new subspecies are also described and named. Copies of the paper may be obtained from the author at Rhos School, Colwyn Bay.

Fredk. J. Killington.

Review: A pocket book of British butterflies, moths and other winged insects. By Charles A. Hall, F.R.M.S. Pp. 140, 40 plates (24 in colour). Published by Adam and Charles Black, London, May, 1938. Price 5s.

This attractively produced little book is designed to 'whet the appetite of the reader for more detailed information,' and 'is not intended for specialists.' Scientific terminology has been avoided and, in most cases, only the English names of the insects are given.

There is an introductory section dealing very simply with the structure and life-history of Lepidoptera (pp. 13-22), and this is followed by short notes on every British species of butterfly and on many moths (pp. 22-106). Further sections give short accounts of the may-flies (pp. 106-110), caddis-flies (pp. 110-115), dragonflies (pp. 115-120), humble bees (pp. 120-128) and the social wasps (pp. 128-133). An index completes the book.

The plates are a special feature of the book. These reach a very high standard of excellence and are beautifully reproduced. Over 300 species of insects are figured, including all the British butterflies, over 200 moths, a number of lepidopterous larvae, and representatives of the other groups mentioned above.

The book should certainly achieve its object.

FREDK. J. KILLINGTON.

Review: A monograph of the British aberrations of the chalk-hill blue butterfly Lysandra coridon (Poda, 1761). With suggestions for the standardisation of aberrational terms for other Rhopalocera. By P. M. Bright, J.P., F.R.E.S. and H.A. Leeds. Pp. ix + 138, 18 plates (four in colour). Printed and published by the Richmond Hill Printing Works, Ltd., Yelverton Road, Bournemouth, March, 1938. Price £3 3s. 0d.

Mr. Percy M. Bright's collection of British Lycaenidae, and particularly of the species *Lysandra coridon* (Poda), is probably the finest and most complete one ever amassed in this country, and it is mainly on this material that the present exhaustive monograph is based. Other collections have been studied, however, in order to embrace all known forms of the species.

An endeavour has been made to classify, describe and name every form of *Lysandra coridon,* the result being that about 400 different forms are now accounted for, many of them for the first time. The system of nomenclature adopted is a logical one, but unfortunately results in the coining of compound names of great length and complexity. 'The authors hope that if the nomenclature is generally adopted, it will standardise the forms,

not only of *Lysandra coridon,* but also most, if not all, of the other Lycaenidae, and clear away the existing multiplicity and confusion. It may also, with the addition of other terms, apply to the remaining species of Rhopalocera.'

The opening sections of the book include an account of the life-history and range of the species, brief notes on male and female scaling by F. N. Pierce, and on homoeosis and gynandromorphs by Dr. E. A. Cockayne. The use of abbreviated prefixes (anti-, post-, sinis- and dex-) to indicate which wings are affected by variation is then given, followed by an introduction to the aberrational forms and their nomenclature. The next section (pp. 9-86) is devoted to a description of the typical form of *L. coridon,* and to short but adequate descriptions of every known aberration. Suggestions for the arrangement in collections of specimens under aberrational terms are given on pp. 87-94; an explanation of affixes used in the nomenclature on pp. 95-98; tabulations of previous terms used by other authors and employed in the present work on pp. 99-109; the standardisation of aberrational terms for other species, with an index to these terms, on pp. 110-119. The volume concludes with a general index to the text and another to the plates.

No fewer than 402 figures are reproduced from photographs on the eighteen plates, 96 being in colour. These are all as near perfection as modern reproduction can make them.

Without going into the debatable question of nomenclature, there can be no doubt that the book provides a unique and valuable record of variation and should be warmly welcomed by Lepidopterists all over the world.

A word of praise is due to the publishers for the high standard of craftsmanship reached in producing the book.

FREDK. J. KILLINGTON.

Review: Medical entomology. A survey of insects and allied forms which affect the health of man and animals. By William A. Riley, Ph.D., Sc.D., and Oskar J. Johannsen, Ph.D. Second edition, pp. xiii + 483, 184 figs. Published by McGraw-Hill Publishing Company, Ltd., London, 1938. Price 25s.

New data have accumulated so rapidly since this extremely valuable work was first published in 1932, that it has become necessary to revise the original text and to issue the new edition now reviewed. In view of recent researches changes and additions have been made throughout the book, and previous conceptions have in certain instances been corrected or modified. Only a few of the more important facts brought forward in the new edition can be mentioned.

It is now stated that the dreaded kala azar disease of southern Europe, Asia and Africa may possibly be transmitted by flies of the genus *Phlebotomus,* and that the case against *Cimex* (the bed-bug) has not been made out by experimental work. It has also been demonstrated that encephalomyelitis, a highly fatal disease of horses, can be carried by mosquitoes of the genus *Aedes* and by the tick *Dermacentor andersoni,* although 'other important modes of infection probably exist.' New facts of great importance regarding the distribution and vectors of such diseases as Rocky Mountain spotted fever, endemic typhus, Chagas' disease, jungle yellow fever and sylvatic plague are brought together and discussed. Another important discovery is that in America larvae of the dipteron *Cochliomyia hominivorax* Coq. (=*americana* Cushing and Patten) cause cutaneous, rhinal and aural myiasis, diseases previously attributed to *C. macellaria,* which is now stated to be a secondary invader.

Although, as its title implies, the book is written primarily for students of the many unpleasant and often fatal diseases of man and animals caused by or transmitted by insects and their allies, it is a work which should be on the bookshelves of all serious students of entomology. Apart from the medical aspect, it contains an enormous amount of information on the structure, habits and life-histories of insects of a number of important orders, and much of this information is of a type not to be found in the ordinary entomological text-book. The text is well written and grips the interest and attention from beginning to end, while the illustrations are well selected and of a high standard.

A supplementary bibliography of six pages has been added to the new edition.

Fredk. J. Killington.

CONTENTS—CONTINUED.

PAGE

GRENSTED, PROF. L. W., M.A., D.D., F.R.E.S.: Trichoptera in the Chitty Collection 265

JANNINGS, C. M.: *Satyrus galathea* (L.) (Lep.) attacked by birds 254

———— *Lysandra coridon* (Poda) (Lep.) feeding on horse droppings 254

———— Resting-place of *Pararge megera* (L.) (Lep.) ... 254

KILLINGTON, F. J., D.Sc., A.L.S., F.R.E.S., F.S.B.E.: Chalcidid (Hym.) parasites from *Eriopeltis festucae* Fourc. (Hemipt.) 264

———— A Hymenopterous parasite from *Chrysopa albolineata* Killington (Neur.) 265

KIMMINS, D. E.: Supplementary notes on the life-history of *Micromus variegatus* (Fab.) (Neur.) 239

———— The first instar larva of *Nathanica capitata* (Fabr.) (Neur.) 240

MORLEY, B. D. W., M.I.C.E., F.R.H.S.: *Myrmica scabrinodis* Nyl. var. *sabuleti* Meinert (Hym., Formicidae) in the New Forest 259

———— A few new records of British Formicidae (Hym.) 259

———— *Myrmica scabrinodis* Nyl. (Hym., Formicidae) at 1,200 feet 259

RICHARDS, A. W., M.A., B.Sc., F.R.G.S.: Odonata in north-east Hants, 1938 262

———— Early appearance of butterflies, 1938 264

RICHARDS, O. W., M.A., D.Sc., F.R.E.S.: Some records of British Lonchoptera (Diptera) 246

TAYLOR, E.: Emergence of Tachinid larva (Dipt.) from its host 261

REVIEWS 267

Communications for publication in the *Journal* should be sent to the Editor at 68 Whitworth Crescent, Bitterne Park, Southampton.

SOCIETY FOR BRITISH ENTOMOLOGY

List of Publications for Sale (all prices are post free)

SYSTEMATIC WORKS.

BRITISH HEMIPTERA-HETEROPTERA. By H. P. Jones, 1930. 88 pp., 2 Pls. 4*s.* 6*d.*

BRITISH NEUROPTERA. By F. J. Killington, 1929. 36 pp., 6 Pls., 6 Figs. 4*s.* 0*d.* With Supplement (*Hemerobius*), 1934, 5*s.* 6*d.*

BRITISH TABANIDAE (Dipt.). By E. R. Goffe, 1930. 71 pp., 2 Pls. Out of print.

BRITISH TIPULINAE (Dipt.). By H. L. F. Audcent, 1932. 35 pp., 3 Pls. 4*s.* 0*d.*

KEYS TO BRITISH ASILIDAE (Dipt.). By B. M. Hobby, 1932. 6 pp. 1*s.* 9*d.*

MEIGEN'S 'NOUV. CLASS.' 1800. By E. R. Goffe, 1932. 7 pp. 1*s.* 0*d.*

BRITISH LIRIOPEIDAE (Dipt.). By H. L. F. Audcent, 1934. 12 pp., 4 Pls. 1*s.* 9*d.*

BRITISH MECOPTERA (Synopsis and Feeding Habits). By B. M. Hobby and F. J. Killington, 1934. 11 pp., 2 Pls. 1*s.* 6*d.*

BRITISH SPECIES OF DACNUSA (Hym.). By G. E. J. Nixon, 1937. 88 pp., 22 Pls. 12*s.* 0*d.*

BRITISH SPECIES OF EPEOLUS AND KEY TO SPECIES OF COLLETES (Hym.). By O. W. Richards, 1937. 42 pp. 21 Text-figs. 4*s.* 0*d.*

BRITISH SHORT-PALPED CRANE FLIES, with a Key to the Families of British Nematocerous Diptera. By F. W. Edwards, 1938. 168 pp. 5 Pls. 31 Text-figs. 15*s.* 0*d.*

FAUNAL LISTS.

TORTRICES OF HANTS AND I.O.W. By W. Fassnidge, 1929. 20 pp. 1*s.* 6*d.*

MACRO-LEPIDOPTERA OF HANTS AND I.O.W. By W. Fassnidge, 1925. 42 pp. 1*s.* 6*d.*

HYMENOPTERA ACULEATA OF HANTS AND I.O.W. By H. P. Jones, 1926. 13 pp. 1*s.* 0*d.* With Supplement, 1932, 1*s.* 6*d.*

PARANEUROPTERA OF HANTS AND I.O.W. By F. J. Killington, 1926. 9 pp. 1*s.* 0*d.*

LIST OF BRITISH COLLEMBOLA. By F. A. Turk, 1933. 6 pp. 1*s.* 0*d.*

LIST OF DORSET LEPIDOPTERA. By W. P. Curtis. Introduction and Part I, 1934. 102 pp. annotated. 7*s.* 6*d.*

Other Faunal Lists no longer available as separates will be found in the Transactions and Journal.

GENERAL WORKS.

'ENTOMOLOGY AND ETHICS.' By W. Fassnidge (Presidential Address, 1931), 1932. 16 pp. 1*s.* 0*d.*

BIBLIOGRAPHY OF ENTOM. NOTES IN PUBLICATIONS OF BRITISH LOCAL SOCIETIES. (An indispensable Supplement to the Zoological Record.)
Part I, 1933. 24 pp. 2*s.* 6*d.*
Part II, 1934. 18 pp. 2*s.* 6*d.*
Part III, 1935 (The Naturalist). 67 pp. 2*s.* 6*d.*

SERIAL PUBLICATIONS.

ENT. SOC. S. ENGL.

THE JOURNAL.

Parts I–IV, 1932–33 (in all 112 pp., 1 Pl.). 2*s.* 6*d.* each.

THE TRANSACTIONS.

No. IV,	1928	4*s.* 0*d.*
No. V,	1929	7*s.* 6*d.*
No. VI,	1930, out of print.	
Vol. VII,	Part 1, 1931 ...	7*s.* 0*d.*
Vol. VII,	Part 2, 1932 ...	10*s.* 6*d.*
Vol. VIII,	Part 1, 1932 ...	8*s.* 0*d.*
Vol. VIII,	Part 2, 1933 ...	7*s.* 0*d.*

SOC. BRIT. ENT.

THE JOURNAL.

Vol. I,	Part 1, May, 1934 ...	2*s.* 6*d.*
Vol. I,	Part 2, Oct., 1934 ...	2*s.* 6*d.*
Vol. I,	Part 3, April, 1935 ...	2*s.* 6*d.*
Vol. I,	Part 4, Oct., 1935 ...	2*s.* 6*d.*
Vol. I,	Part 5, March, 1936 ...	2*s.* 6*d.*
Vol. I,	Part 6, August, 1936 ...	2*s.* 6*d.*
Vol. I,	Part 7, June, 1937 ...	2*s.* 6*d.*
Vol. I,	Part 8, March, 1938 ...	2*s.* 6*d.*

THE TRANSACTIONS.

Vol. I,	Part 1, June, 1934.	10*s.* 6*d.*
Vol. I,	Part 2, Nov., 1934	12*s.* 0*d.*
Vol II,	Part 1, July, 1935.	12*s.* 0*d.*
Vol. II,	Part 2, Oct., 1935.	12*s.* 0*d.*
Vol. III,	Nov., 1936.	17*s.* 6*d.*

(After Vol. III each Paper forms a separate part.)

Orders, accompanied by the appropriate remittance, should be addressed to **E. Rivenhall Coffe,** Hon. Sec., 102, High Street, **Southampton.**

SMITHSONIAN INSTITUTION THE LIBRARY

SMITHSONIAN INSTITUTION THE LIBRARY

SMITHSONIAN INSTITUTION LIBRARIES
3 9088 01269 9344